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Nutritional Anemia in Infants

THE iron stored in the infant's liver at birth is rapidly depleted during the first months of life (Mackay,¹ Elvehjem²). During this period the infant's diet contains very little iron—1.44 mg. per day from the average bottle formulae of 20 ounces, or possibly 1.7 mg. per day from 28 ounces of breast milk (Holt³). For these reasons, and also because of the low hemoglobin values so frequent among pregnant and nursing mothers (Coons,⁴ Galloway⁵), the pediatric trend is constantly toward the addition of iron-containing foods at an earlier age, as early as the third or fourth month (Blatt,⁶ Glazier,⁷ Lynch⁸).

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The tragedies these disorders heap upon little heads are very real tragedies. But even more serious is their possible influence on the child's future. The "laughed-at" child so often becomes the crushed and morose adolescent. And the morose adolescent frequently becomes an embittered man or woman in an unfriendly world.

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The minimum daily intake which will prevent rickets in infants is probably between 135 and 400 International units of vitamin D as supplied by cod liver oil (1). The optimum prophylactic dose is probably in the neighborhood of 1000 International units (2). It is also interesting to note that the League of Nations Technical Commission has recommended a daily intake of 340 International units of vitamin D for pregnant and lactating women (3).

Irradiated pasteurized milk containing 135 International units per quart and irradiated evaporated milk of the same potency have been found equally effective in preventing rickets in infants. The pediatrician will be interested in the following summary taken from a recent review:

"Such evidence as is available may be interpreted to show that cod liver oil, cod liver oil concentrate milk, and irradiated milk are of equal potency for the human being, unit for unit." (1-b).

Other than the above recommendation for vitamin D intake during pregnancy and lactation (3), little definite information is available upon which to establish minimum vitamin D requirements of the human after infancy (1), yet while sunlight produces the anti-rachitic factor, most common foods are known to be deficient with respect to vitamin D (4). However, certain foods such as eggs, butter, liver and sea foods do supply this vitamin. The importance of sea foods, especially canned salmon, as carriers of vitamin D has been definitely established. A recent report on the vitamin D content of different varieties of canned salmon gave a value of 1.9 International units per gram for the least potent brand and 6 or more units per gram for several other brands (5).

From a consideration of the vitamin D values of salmon oil, the oil content of canned salmon and the quantity of canned salmon consumed annually in this country, it has been concluded that there is more vitamin D in the canned salmon sold in this country than in the cod liver oil used for both human and animal feeding (6).

Although neither the minimal nor optimal requirements of individuals of different ages are definitely known, the values of evaporated milk fortified with vitamin D and of canned sea foods as sources of this important vitamin, are well established.

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(1) a. 1937 J. Am. Med. Assn. 108, 206
b. 1936. Ibid. 106, 2150

(2) 1936. J. Am. Diet. Assn. 11, 503

(3) 1936. League of Nations Report
on Physiological Bases of
Nutrition, League of Na-
tions Publication Depart-
ment, Geneva.

(4) 1935. J. Am. Diet. Assn. 11, 119

(5) 1935. J. Home Econ. 27, 658

(6) 1931. Ind. Eng. Chem. 23, 1066

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*Proc. Soc. Exp. Biol. and Med., 1934, 32, 241-245
Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154
N. Y. State Jour. Med., June 1935, Vol. 35, No. 11
Arch. Otolaryngology, Mar. 1936, Vol. 23, No. 3
Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60

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No. 11, 590; Laryngoscope 1935 XLV,
149-154. Proc. Soc. Exp. Biol. and Med.,
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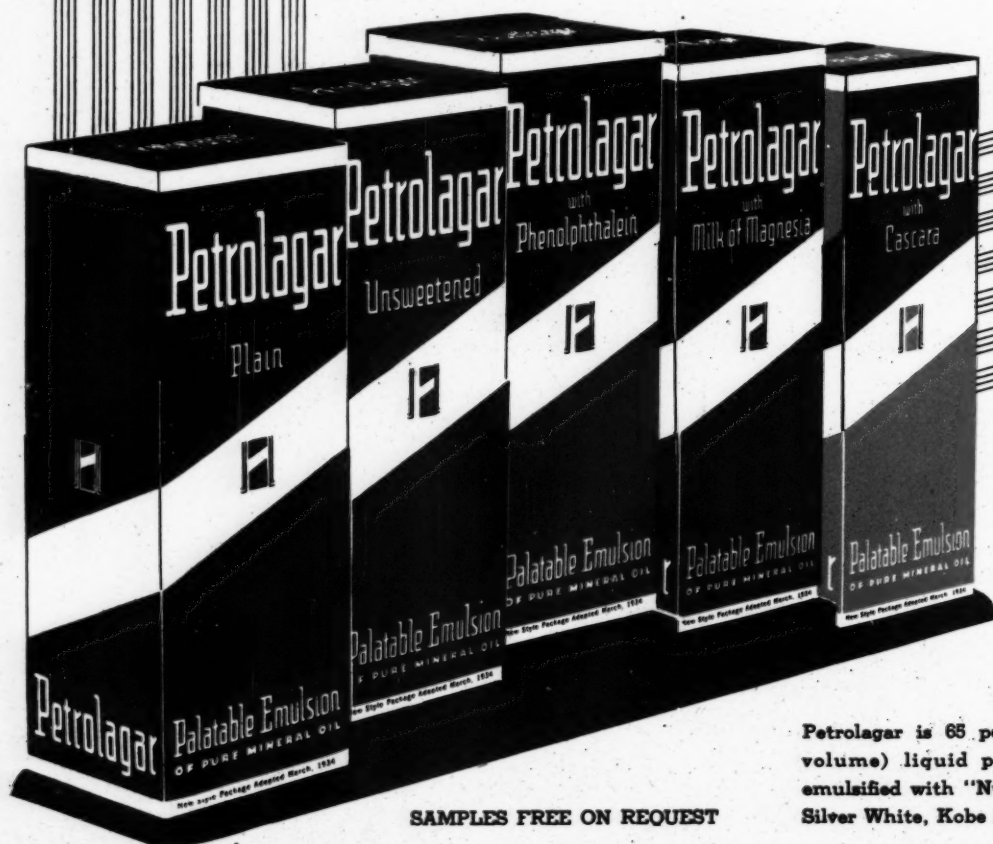
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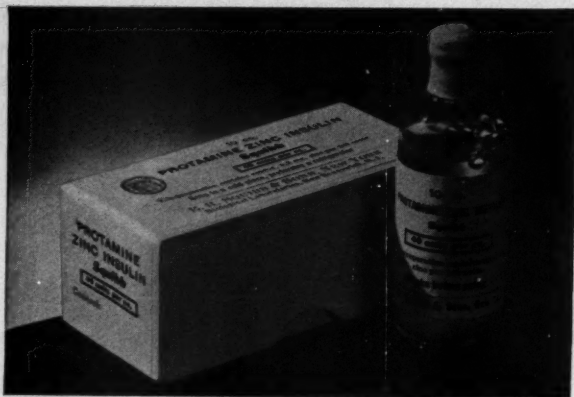
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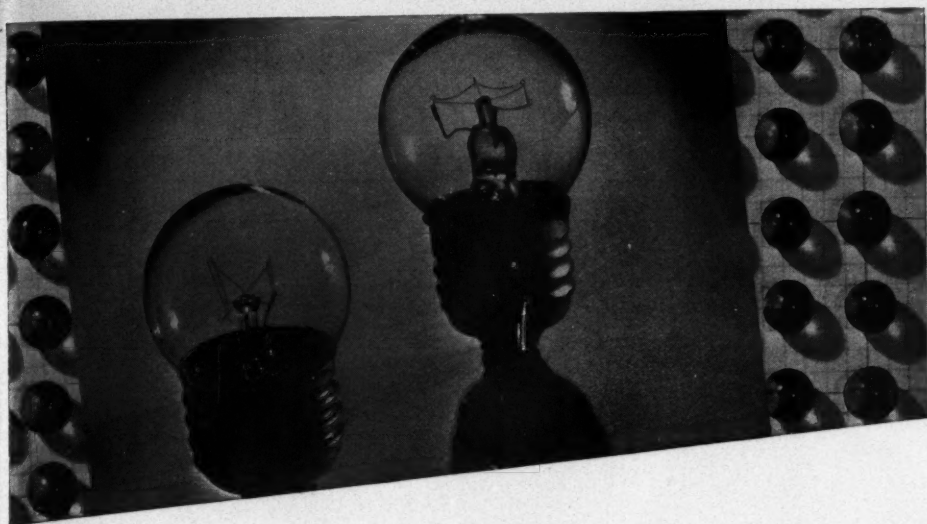
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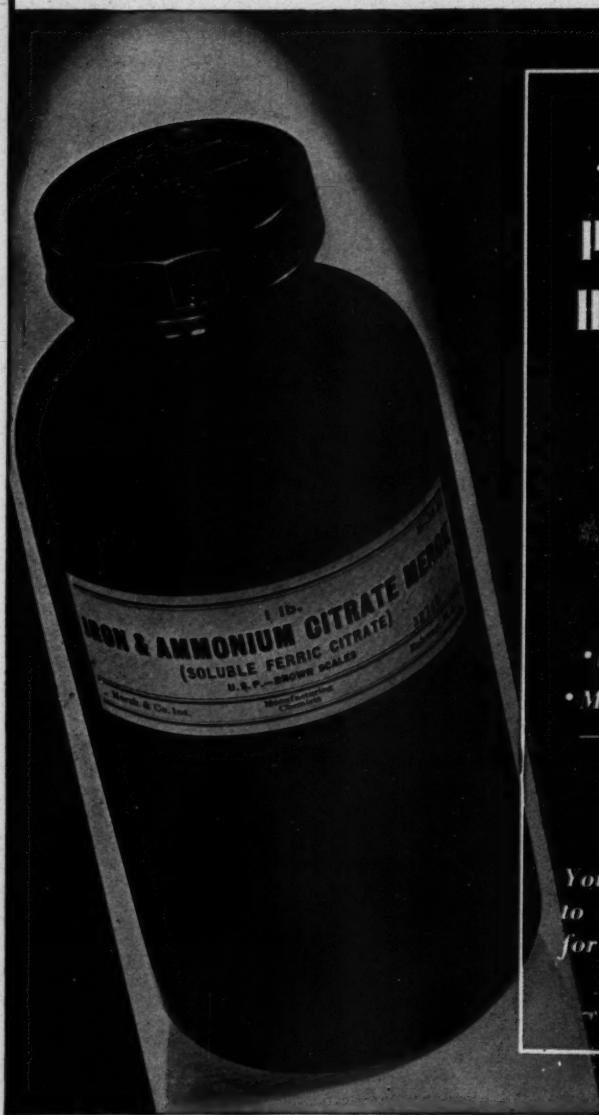
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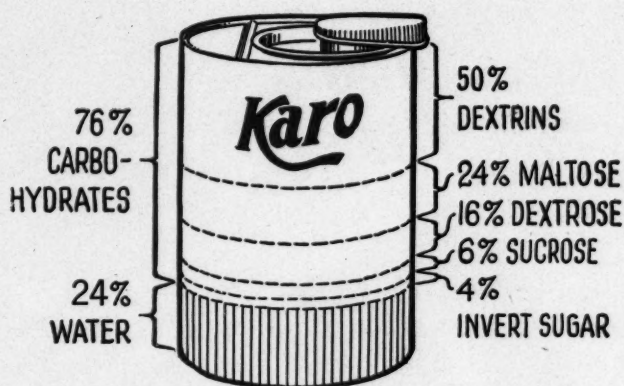
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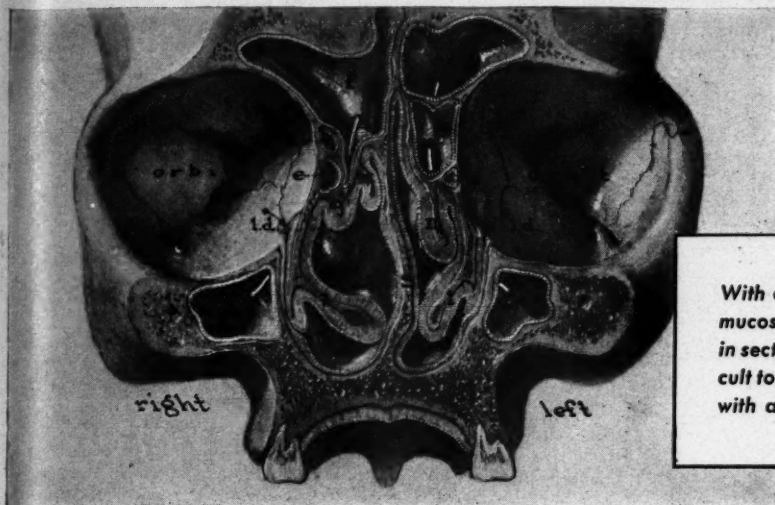
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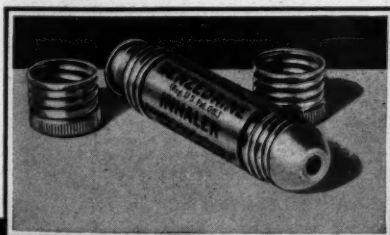


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EMOTIONS

M. A. TARUMIANZ, M. D.*
Farnhurst, Del.

Of all human factors which play a definite role in human adjustments, showing an influence in the relationships between individuals, groups and even nations, nothing has been of greater importance in the welfare of society than the emotions. Yet, in studying literature, we find a great variation of ideas regarding them. The question is always present as to which are inherited and which are not; which are normal and which are not. The behaviorists would disregard practically all laws of heredity in connection with them, recognizing only a few fundamental ones such as fear and sex. To them the infant is a mass of protoplasm whose entire welfare is based on stimulus and response. It is undoubtedly true that the infant, extremely imitative, acquires many reactions from the environment. They may fear certain things, they may be enraged at other factors which play no effect on other members of the group, but it is undoubtedly true that the ability to express the emotion is inherent in the individual, is greatly physiological in character, and that the nature of the stimulus which arouses a particular emotion is mainly acquired. There are certain factors towards which all individuals react in a rather definite manner from childhood. These factors are those which deal primarily with self-preservation or preservation of the race; they are of primary importance in the individual depending greatly on the social group in which he is reared.

However, infants show definite fear reactions at an extremely early age, of such a manner that it seems impossible for the environmental aspect to take a part. Thus we see the very young infant reacting with fear

towards a sudden unexpected noise or towards falling, even though he has had no such previous experience. Undoubtedly the sexual emotions are inherent since they also are essential to the preservation of the race and the lack of it would result only in race suicide. Anger is closely related to fear and would seem to be an attempt to establish the personality after a primary fear reaction psychiatrically tends to undermine the successive strivings of the individual. Anger is most frequently based on an insecure status and is an attempt, unconsciously, to assert the individual who is really laboring under fear of failure or exposure.

Some authorities feel that normal emotions are those emotions which flow along pleasantly with the personality, such as joy and love, and are conducive to the most efficient working of the organism. It is so claimed that abnormal emotions such as fear and anger lead to inefficiency and are therefore antagonistic to the well-being of the individual. This is undoubtedly true when the stimulus which produces these reactions is of such a type that the resulting emotion is an unnecessary reaction since the bodily stimulation, physiologically produced, is unnecessary for the safety of the animal. But fear as an emotion is protective to the individual and prevents him from entering into danger unnecessarily, or gives him more strength to fight danger when this is needed. We may, therefore, consider two fundamental types of emotions, both of which are necessary to the well-being of the individual under proper stimulation. We have, thus, a self-defensive type with emotions of fear, rage, hate, and jealousy, and a self-forgetful type which produces the emotions connected with all variations of love. The self-defensive emotions are destructive if they react to improper stimulations, but the self-forgetful emotions may also be destructive if

*Superintendent, Delaware State Hospital and Director, Mental Hygiene Clinic.

the opposing emotions do not react to the proper stimulation in type and quantity when such stimulations do occur. It is undoubtedly the self-protective emotions which are the ones most markedly involved in the mental conditions resulting from emotional maladjustment. Those of the self-forgetful type, antagonistic to the self-defensive type, are less often at conflict with the psychic mechanisms of the individual.

In resume we can say that psychologically, certain stimuli, either from the environment or from the body, reacting on the conscious or unconscious mind, react on the emotional centers, causing a degree of intensity, which results in varying degrees of excitement. This excitement produces certain feelings, the type of these feelings depending upon conscious and unconscious relationship between the stimulus and the emotion. This relationship may be inherent, in which case it is simple in character and based on the two greatest human drives, self-preservation, or preservation of the race; or it may be acquired through various factors in the environment so that we see a great variation in the types of emotions produced by the same type of stimulus in groups of individuals. The emotion of fear being the strongest, since it is self-preservative in nature, produces the greatest variations. A single incident in infancy or childhood arousing fear under inadequate stimulation may continue to do so throughout life if repeated. Emotions may be antagonistic in character. So fear may be accompanied by anger or strong curiosity or jealousy with desire for combat. In such a case the stronger emotions will rule. The overcoming of fear by other emotions usually occurs in adult life when experience has lessened the strength of the reaction to the stimulus. So we have adults who will voluntarily enter into dangerous situations in spite of fear because of curiosity or desire for combat. The professional soldier, big game hunter, and explorers are people who react most consistently in this manner when physical courage is shown. However, the same condition is constantly existing in those people who are constantly fighting mental battles with fear of failure against a desire for success. Fear without an antagonistic desire results in flight when physical danger threatens. Where mental forces are at work

it results in flight of a different type, or maladjustment.

The anatomical and physiological aspects of the emotions are still a rather unexplored field. The centers of emotional activity are in the midbrain since animal experimentation has proven that animals with cerebral hemispheres destroyed can still demonstrate definite emotional activity although reason and comprehension are lacking. These possibilities of emotional reactions are modified by the secretions of the endocrines. The conscious centers of the brain react on the emotional centers. Nature has produced a definite nerve system, the sympathetic nervous system, which then produces definite reactions appropriate to the emotion aroused. This nervous system is closely connected with the internal organs of the body and in extreme emotional reaction a definite awareness of these organs may exist. I use the term awareness because it is not pain but a distinct feeling which is characteristic of this type of stimulation. The endocrine glands, having the same bodily relation as the internal organs, are also stimulated by the sympathetic nervous system, which stimulation causes an increase, at times a decrease, of the secretions. This change in body chemistry now prepares the animal to meet the emotion, react to it, and so release the mental tension which emotions produce. So the adrenals, on stimulation, secrete more adrenalin which causes liberation of sugar from the liver, the oxidation of which causes an increase of body strength which better prepares the body for combat or flight. The other endocrines in all probability play a similar role but the procedure has not been as well demonstrated. Irritable, grouchy people, ready to become angry at the slightest stimulus, are often tired people who are unconsciously looking for the stimulus which will start this mechanism, thus releasing more energy and temporarily release them of fatigue. They are seeking to produce a constant adrenal stimulation to induce more energy, making it possible to complete the problem at hand.

I have now attempted to explain briefly the cause, both psychological and physical, of the various emotions and their reactions. Self-forgetting emotions are harmonious emotions and therefore show less variation and are of less importance to the welfare of society. Their

intensity, as of all other emotions, depends upon the endocrines and upon the development of the autonomic nervous system. They are, as a rule, less intense than the self-defensive emotions, since the stimulating factor is not antagonistic to the individual's welfare, either physically or mentally.

Fear in primitive life was aroused only when some factor threatened the life of the animal. Since that which is unexpected or sudden, contrary to the immediate environment, threatens the individual, we have in infants only two stimuli which give a definite fear reaction, namely: dropping or a feeling of loss of equilibrium, or a sudden noise. The emotion of fear reacts to stimuli of other types only when the child goes through experiences which threaten him physically or when he hears about dangerous situations and meets them in actuality or as he conceives them in actuality, or through imitations or seeing the fear of others towards given situations. The inherent desire to predominate or establish the personality is protected primarily against antagonistic stimuli by an emotion of anger. Therefore, abnormal physical fears are acquired. Fears on the mental level are acquired also, but are fundamentally a result of our present social status. Fears of failure in business, school, and social adjustment are abnormal when we consider the inherent mechanism of the individual. They are purely a result of civilization and the witnessing of the results of failure in others; or repeated uncomfortable consequence of minor intellectual or social failures producing a fear reaction which defeats itself since the physiological result of the emotion is the same whether inherent or acquired. Since the physiological result of fear is increased muscular energy preparing the animal for escape or combativeness, we find that fears associated with mental difficulties also give the same desire to combat or escape. Combativeness results in displays of anger, often unaccountable to others, with the conscious mind centered on this reaction resulting in errors of judgment and inefficiency. These errors of judgment during anger are not based on anger alone, but rather to the fact that the individual himself is unable to explain, or does not understand the reactions himself. He will go

through all efforts to rationalize the cause of his anger, to give himself and others a logical explanation of this reaction. If the desire to run predominates, he finds that this is physically impossible, if in the present day he is still to satisfy his gregarious instinct. Therefore, after repeated useless stimuli he finally runs away or escapes "mentally" into the psychosis or neurosis. It is necessary for him to repress his emotion until the repeated repressions have become too great and he must seek his escape, as is inherently demanded. It is not the first or second stimulus of one type or two or three of various types which cause maladjustment, but repeated stimuli over long periods of time. Repression of any emotion, which society demands to such a great extent, may cause the same maladjustment with some variations. The breaking of taboos and laws is associated with fear, since it results in social conflict and disgrace. No matter how these taboos and laws may be contrary to the inherent instincts of the individual. It is for this reason that the sexual instinct is the one which is so frequently the cause of mental maladjustment. No instinct is so cluttered with taboos and laws, and yet this instinct is one of the strongest in the individual since it is through this instinct that the race continues.

Physical fear should be aroused normally only when life itself is in danger. Yet, many people are constantly hampered by many fears of slight nature, namely, fear of dark, fear of remaining alone, etc. These fears all are acquired and many a nurse maid or parent has forced a child to live through life by attempting to frighten it into good behavior.

Emotions may be now described as "conscious feelings associated with some primitive instinct, experienced in the presence of some unusual situation and accompanied by certain changes in the endocrine secretion."

Brief intense emotional experiences are considered as passions, while moderate emotions extending over a long period of time are considered moods.

In fatigued mental and physical states the emotions are more readily aroused and the fatigue vanishes temporarily.

Since we have left the primitive stage, and the environment which was equable for nearly all in the group, and since socialization has

forced the individual to withhold many of his primary instinctive desires for future achievement or for the good of the group, there is an ever increasing tendency for conflicts to arise. An unpleasant experience accompanied by a strong emotional reaction may result in complex submerged mental states with resulting prudishness, fanaticism, shame reactions, hoarding, or one of many other characteristics of the humane individual. Constant repression of any emotion, whether of the self-defensive type or the self-giving type, produces disturbances or deviations of the emotions. We have discussed the reactions of the self-defensive emotions. The self-giving emotions in which love and sex predominate may also be abnormally stimulated by adverse environment, resulting in onanism, in sadism, or homosexuality and many other sexual deviations. Conversion of any of the emotions may result in neurotic states. Emotions in conflict with instinctive drives and social laws are often of such a disturbing nature that they are buried in the subconscious, the emotional reaction appearing in the conscious mind with the proper stimulus without realization of the stimulus response reaction. Since the conscious mind is much more aware of emotional states than it is of logical thinking, the individual is apt to confuse emotions for reason with the consequently erratic acts which occur. If the conflict is so great that it is impossible for the mind to accept it, it may be completely shut off and a disassociation of the personality may occur. This is manifested in marked cases by twilight states, dual personalities, and is often evinced in mediums. Milder degrees of disassociation are probably the cause of the rapid mood swings which occur in some unstable individuals.

Fear, usually mental and not bodily, is the most frequent cause of the major neurotic states. These states may occur in three different mental levels, not apparently associated with the intellectual capacity of the individual. At the purely conscious level are found the compulsion states and psychasthenia. At the sensory level there are found the neurasthenias with various bodily complaints. There may be present in this group a constant feeling of awareness because of the stimulation of the autonomic nervous system; but this group

misinterprets these feelings into actual pain. The other emotional level, where logic does not exist in any way, are found the anxiety states and hysteria.

Emotions as such, with the possible exception of fear and sex, are not inherited but the ability to experience emotions is. The resistance to extremes of emotions is inherited and there are some individuals with a primarily lowered emotional threshold who react to slighter stimuli and who are fundamentally unable to control or understand these reactions. Intellectual endowment seems to have nothing in common with this lowered threshold as many of the most highly intellectual individuals fall prey to emotional maladjustments. These maladjustments are an attempt to escape from a poorly understood emotional conflict, the most complete escape being in insanity. The most common cause of maladjustment is fear, the next sex. It is interesting to see that the primary causes of emotional maladjustment in civilization is based on the two most powerful instinctive drives, preservation of self and that of the race.

I have attempted to crystallize the working mechanism of our emotions to an extent that one will have proper understanding as how to overcome reactions to his emotions based on either physiological or psychological factors. One can and must, if intelligent enough to analyze his emotions, overcome the pathological reactions of such emotions by adequate social outlet. It is time to realize that repression and inhibition of our emotions with a consequent escape is a wrong remedy, but it is also true that by proper understanding one can use the energy produced by emotions by means of sublimation, for creative purposes.

EPILEPSY

PERSIS F. ELFELD, M. D.*

Farnhurst, Del.

Epilepsy is a fairly common condition and is, according to available statistics, a more or less familiar picture to all physicians. It is estimated that two to five of every one thousand persons suffer from this condition. The incidence is probably greater since, in the lower strata of society, it is considered as an incurable condition and frequently does not

*Assistant Superintendent, Delaware State Hospital and Clinical Director, Mental Hygiene Clinic.

come to the attention of the physician, the family accepting the situation as such. Very little is known about the condition although hundreds of papers have been published and also much research work has been carried on. Many theories have been advanced as to its cause and a few pathological lesions have been found which definitely cause "epileptic convulsions," but still a greater number of the cases suffer from the seizures without apparently showing any physical etiology. The laboratory has been unable to produce any constant findings in series of hundreds of cases. Epilepsy, of course, cannot be considered a disease any more than a headache can be. It is primarily a symptom and may be caused by various factors, some known and some unknown, yet the term so firmly connotes a disease in the minds of the lay people as well as those of the profession that it will be extremely difficult to change this concept. "Convulsive state" has been suggested as a more satisfactory term and is gradually coming into common use. When we consider the manner in which the term is used in the present day, to be entirely in faith with oneself, it must be admitted that the person using the term is merely stating that he is describing a symptom complex, and that he is entirely ignorant as to what the disease may be. When he is familiar with the etiological cause, he immediately changes the diagnosis to brain tumor, porencephaly, etc. However, it may be defined as a "condition characterized by recurring attacks of unconsciousness with or without convulsive movements." The word is derived from the Greek—*epi*—meaning upon and—*lipsis*—meaning seize. The Latin term is "*Morbus Caducus*" meaning falling sickness. As stated before, two to five out of every one thousand of the population suffers from epilepsy, these statistics being obtained from examinations of the drafted men in the late war. Switzerland also estimates that five out of every thousand suffer from the condition. From these figures it can be seen that there are 4,600 to 11,000 epileptics in Delaware. This is a wide range and bears further study. The incidence is probably higher when we consider the unreported cases, most of which suffer from petit mal and pyknie form types or those in which the diagnosis of brain

tumor, etc., is made and epilepsy used as a purely symptomatic term. There are also many cases in which epilepsy is truly present although the condition has been diagnosed as simple syncope.

The history of epilepsy extends back through many generations. In fact, it is impossible to determine even approximately the date of onset. Stories handed down through generations would seem to indicate that people suffered from epilepsy before written language was prevalent. Thus the history of the activities of certain individuals who lived many centuries ago would seem to indicate that there was a certain lapse of consciousness present. It is closely connected with folk lore and theology of primitive people. The dramatic character of the symptoms made a supernatural impression upon the populace and in some cases the individual was considered to be possessed of demoniacal influences. These were probably the cases in which violence and intense irrationality occurred. In others, possibly in such cases where the aura was connected with hallucinatory experiences, divine visitation was considered the cause. This belief still holds true to the present day in primitive individuals and in those of questionable mentality with a highly hysterical personality. Hippocrates argued that the condition was on a physiological basis and ever since his treatise on the subject the etiology has been the subject of speculation and research. Religions, which today involve millions of people, have been based on the hallucinatory experiences of individuals who were, according to all historical stories, probably epileptic.

Various classifications have been made of the epilepsies in order to help clear the general confusion which still exists. For this purpose two major classifications may be made: namely, the symptomatic types and the idiopathic types. The symptomatic types are those in which some definite disease is found which is the cause of the convulsive seizures, the main pathological processes being brain tumor, porencephaly, brain injury, toxemia, tertiary syphilis of the central nervous system, cerebral arteriosclerosis and various infectious processes causing encephalitis, and multiple sclerosis. The idiopathic group gathers together all of the convulsive seizures about

which the medical profession must admit that it knows nothing. Various classifications have been made which are based on the description of the seizures themselves. Kinnier Wilson gives a classification which is not commonly used, at least in this country, and seems to be more or less cumbersome. This classification is as follows:

A. Motor Epilepsy.

1. Myoclonic jerks without loss of consciousness.
2. *Epilepsia partialis continua* (Kojewnikoff's epilepsy).
3. Tonic epilepsy (so-called cerebellar fits).
4. Co-ordinated epilepsy (grand mal attacks).
5. Akinetic epilepsy (transient flaccid states).

B. Sensory Epilepsy.

1. Reflex.
2. Sensory.
3. Affective.

C. Psychic Variants.

D. Visceral variants.

The more commonly used classification of the seizures themselves is as follows:

Epilepsy:

- Grand mal.
- Petit mal.
- Jacksonian.
- Epileptic equivalents.

Another classification given, which does not designate the type of convulsion and is also not generally used in case study, may be presented:

Epilepsy tarda—attacks starting late in life.

Epilepsy partialis continua—continuous twitching.

Epilepsy nocturna—occurring only at night.

Various parts of the human anatomy have been blamed for causing the various types and portions of the colon have been removed, endocrine therapy has been carried out, all foci of infection have been removed, but the results have been negative. However, the studies have not been valueless. The fact that a rather high percentage of the patients show symptoms of pituitary dysfunction would indicate

that this gland needs further study. Also, the fact that according to history the onset is often at puberty would indicate that more attention should be paid to the gonads as playing an important etiological role. Dysfunction of the pancreas has also been considered due to the fact that hypoglycemia is often associated with the seizures. Because of the convulsions produced by tetany the parathyroids have come under suspicion but the feeding of calcium has been of no avail.

It is perfectly true that the consensus of opinion is that all types of convulsive states are organic in nature and the research workers must continue their search for the etiological cause and the location of the pathology in the idiopathic types. Many autopsies have been carried out on patients who have suffered from epilepsy but it is, however, impossible to tell in such cases when abnormality may exist, whether this is the result of the seizures or the actual cause. In many cases no actual pathology could be demonstrated. Dandy has reported that the most common pathology found in those cases coming to operation is dilated subarachnoid spaces which form pools of fluid overlying the convolutions which are soft to pressure. This pathology would be difficult to demonstrate at autopsy since there is frequently a loss of the fluid at this time. Spielmyer describes changes in Ammon's horn. His findings have been borne out by other investigators. His histological findings were not only present in cases of idiopathic epilepsy but in the symptomatic types as well. His explanation is based on circulatory changes in animals in which the blood supply to the brain has been interfered with.

Hereditary factors have long been considered as important in the minds of the public as well as the profession. It has long been recognized that there is a tendency or susceptibility in some individuals for certain diseases although the disease itself is not inherited. It is undoubtedly true that in certain pathological conditions convulsive seizures are an important symptom. Yet, others suffering from an identical condition do not have convulsions. It would, therefore, seem that those who are so afflicted do have an inherited tendency. It would also seem true that this tendency may pass through one or more generations before

the physical condition arises due to which the convulsions occur. Most of the statistics available are from institutions who report a large number of the cases as inherited. However, the information does not refer only to convulsive seizures but also to alcoholism, psychoses, etc., which at best are only distantly related to epilepsy. The studies made by several authorities on private patients tend to show that heredity plays a small but very definite role in the production of epilepsy. Some of these authorities have considered migraine as being essentially a portion of the hereditary statistics.

The psychoanalysts have rather timidly, it is true, advanced the theory that idiopathic epilepsy is merely a complete escape from reality. The patient through convulsive seizures avoids with dramatic completeness the necessity of facing, unconsciously, disagreeable reality. I have not read any report of a case of epilepsy cured by psychoanalysis or psychotherapy of any type. Such may exist but if so one would be inclined to wonder if the condition were not a case of hysteria rather than true epilepsy.

The precipitating cause of the onset of convulsive seizures in the idiopathic types is equally as vague as the etiology. A large percentage is found among those individuals who are first among a series of siblings. It is possible that the prolonged and difficult labor often found in the primipara may cause a certain amount of damage to the brain which later manifests itself in convulsive seizures. The onset of most convulsive states is before the age of twenty and the appearance of convulsions after this age should lead the examiner to make a careful study for some known etiological factor. The age of onset as given by patients studied at Craig Colony is as follows:

- 0 to 4 years—28%
- 5 to 9 years—17%
- 10 to 19 years—32%
- 20 years or later—23%

Of a group of non-institutional patients according to Lennox the following statistics were found:

- 0 to 4 years—14%
- 5 to 9 years—13%
- 10 to 19 years—37%
- 20 years or later—36%

The older the patient is at onset the less the chances are that the condition is what we now know as idiopathic epilepsy.

The organic conditions which may cause convulsive seizures have been mentioned before. It also has been stated that all who suffer from these conditions do not have epilepsy. In brain tumor, which is one of the most common causes of convulsive seizures, List has given the following percentages in which the condition has occurred in cases of glioma:

- Of the frontal, parietal and temporal lobes—50%
- Of the fronto-parietal—79.2%
- Of the parieto-occipital—37.5%
- Of the occipital—20%

Tumors of the frontal region often show no localizing signs but are characterized by typical grand mal attacks. He also states that petit mal attacks are infrequent in brain tumors. However, if they do occur they are chiefly observed in lesions of the temporal or frontal lobes, or near the area supplied by the middle cerebral artery. Jacksonian epilepsy is chiefly found in lesions of the fronto-parietal area and at times in the temporal area. They are often found when the pathology is in the motor centers or motor pathways.

Post-traumatic epilepsy may occur years after the injury and may follow concussion as well as actual fracture. It is the feeling of some authorities that there is always present in these cases an inherent tendency toward the condition. In all of these cases true convulsions may not occur, but the condition may demonstrate itself as an epileptic equivalent.

Parker in his studies determined that in 313 cases of brain tumors 21.6% presented major seizures. All of these were located above the tentorium. In 38 cases the convulsions were the initial symptoms.

Lately, in a certain European Clinic, it has been observed that cases of epilepsy who develop dementia praecox cease having seizures. Upon the observation of this fact convulsions were induced by means of injections of camphor, in cases suffering with dementia praecox with the hope of initiating a cure for this disease. The results, as reported, of cases so treated have been good, but as far as can be determined very little work along this line has

been done. One is inclined to be doubtful about the permanency of cure, and relapses would be expected. Yet, it opens new fields of investigation for the study of the causes of dementia praecox as well as epilepsy.

The average physician, when seeing a case of epilepsy, is very apt to pay but little attention to it beyond prescribing a sedative. Yet, the examination of epileptics should be carried out in great detail, indeed, more so because the etiological factors are so little known. It must always be borne in mind that a certain portion of these convulsive seizures are symptomatic in character. True, these cases are in the minority, but since a great percentage of these symptomatic cases can be relieved to a certain extent if the diagnosis is properly made, it is the duty of the physicians to give the patient every opportunity which science has to offer. Unfortunately, there is a tendency to diagnose the condition from history alone. Every epileptic should have a thorough and detailed examination of every body system to discover any organic disease which may exist. Since lack of proper oxygenation seems to play a part in epilepsy, particularly in the petit mal type, even improper posture may play a part. Attacks have been precipitated by allowing a patient to inhale air deficient in oxygen, this, in spite of the fact that oxygen itself is a convulsant. Since symptomatic epilepsy is often an integral part of diseases of the central nervous system, a careful neurological examination is essential. The idiopathic epilepsies are negative neurologically unless the convulsions are severe enough to be the cause of some cerebral accident. For this reason, permanent neurological symptoms should lead the physician to look for some definite etiological factor. A neurological examination does not mean merely attempting to obtain the deep reflexes, but a thorough examination of all portions of the central nervous system, including the autonomic system. The peripheral nerves should be examined as well for signs of abnormality. Scrutination of the eyegrounds is essential. The functioning of the endocrines should be studied and all abnormalities corrected as far as possible with present-day knowledge. Complete laboratory work must be conducted wherever facilities are available. Sugar tol-

erance tests may lead to the discovery of some ill-defined glandular dysfunction. Abnormalities of blood calcium, cholesterol, or nitrogen may show the presence of some physical condition which can be corrected or improved. A blood Wassermann should be a routine procedure to eliminate the possibility of a syphilitic infection. Complete spinal fluid examination may show abnormalities when other examinations are negative. In some clinics encephalographic studies are almost a routine procedure and have at times demonstrated brain pathology which can be corrected. If symptoms indicate that encephalography is contraindicated, ventriloigraphy may be resorted to. X-rays of the skull may show the evidence of old fracture or abnormalities of sella turcica. Intelligent treatment can only be introduced when there is a complete understanding of the organism as a physical unit. The possibility of syncope, migraine, and enuresis being epileptic in character must always be borne in mind.

The symptoms of epilepsy are characteristic, being divided into three major types: Convulsive seizures, momentary loss of consciousness, or temporary, uncontrollable changes in behavior about which the patient has no knowledge on return to normal. In some cases the attacks may occur without warning, while, in others, there may be prodromal symptoms and an aura or both. Prodromal symptoms may occur several days before the seizure. I have had a patient who complained of a backache and a heavy sensation several days preceding, and she was able to tell with considerable accuracy when the seizure would occur. These symptoms may be in the motor, sensory or psychic fields. Some authorities feel that the location of the pathological lesion can be determined by the type of the prodromal symptoms or of the aura. Thus, if they are characterized by changes of mood or hallucinations, the lesion may be found in the higher centers, presumably located in the frontal lobe. If motor in character, the lesion would be found in the motor centers or pathways. The variety of prodromal symptoms are many. There may be changes of mood, either of elation or depression; there may be muscular jerking which continue for several days be-

fore the attack; there may be peculiar sensations of the skin.

The aura, which is present in approximately sixty per cent of the cases, occurs shortly preceding the attack. Some complain of a unilateral turning of the head, others of definite gastric sensations. There may be visual hallucinations as well as other types of hallucinations, although these seem more rare. In one type the patient runs aimlessly, crying out in fear until he falls unconscious. The epileptic cry is well known and usually recognized when once heard. Often the aura precedes the lack of consciousness for a period of time long enough for the patient to protect himself by lying down. Other epileptics can almost be recognized at sight by the numerous scars which they carry since they have had no opportunity for self-protection.

The convulsions themselves are first tonic in character, and then clonic after which the patient relaxes, often falling into a deep sleep for several hours. Cyanosis occurs which is so deep that it is extremely alarming to the uninitiated. Other patients will immediately regain consciousness and carry on with what they were doing with apparently no deleterious effects. At times, there may be a period of confusion following the seizure in which acts of violence may occur without reason. Some patients will show definite behavior changes for several days. In many cases mental deterioration occurs, the individual gradually regressing to a low grade of intelligence, often showing psychotic symptoms. Some show cerebral atrophy on encephalographic study, but it is impossible to tell whether this condition occurred before the seizures or was the result of actual deterioration. Convulsions may be so rare that they occur months apart or they may be of daily recurrence. A series of convulsions may appear on the same day. In a few cases status epilepticus may occur in which consciousness is never regained between the seizures. In all grand mal attacks there is danger of the patient injuring himself, either through falling or biting his tongue, and this must be carefully guarded against by controlling the activities. Physical examination during the seizures shows that the pupils are dilated and do not react to light, this condition continuing for some time after

the attack. The patient is unaware of sensory stimuli. There is often a loss of sphincter control and a positive Babinski sign may be elicited. Vomiting after an attack is a sign of a severe type of epilepsy. Hysteria does not show these symptoms, the patient does not injure himself, does not become cyanosed and the seizures are characterized by an aimlessly throwing about of the arms and legs without the rhythm seen in epilepsy. Some attacks, at the beginning, occur only at night, but these, later, as a general rule finally break over into daily seizures. Because of these nocturnal attacks persistent enuresis, which shows no tendency to react to treatment, should be carefully considered in relation to a convulsive state.

The petit mal attacks are often unrecognized for years and are considered by the parents as fainting spells or syncope. There may be present only a sense of dizziness and twenty or more attacks may occur daily without seriously hampering the individual. This type may precede the grand mal type or may be co-existent with it. Pyknolepsy is a type of petit mal epilepsy in which attacks are extremely frequent, transient in character, occurring only in children. The attacks do not react to treatment but disappear spontaneously at adolescence.

The Jacksonian epilepsies are not true epilepsies although classified with them. Consciousness is not always lost; brain pathology is always present. The convulsive seizures may appear only in one portion of the body although some types are so severe that generalized convulsions with loss of consciousness may occur.

The term, epileptic equivalent, may be broadened to include such conditions as sleep walking and migraine, certain types of dipsomania or narcolepsy. However, the term is generally used when there is a periodic change of behavior with amnesia for any occurrence during this period. Thus an individual may wander away and recover to find himself in some strange environment. All types of peculiar behavior may occur and may result in homicide or other attacks of violence. It is in this type of epilepsy that one might seriously consider the psychogenic explanation as to the etiology.

The treatment of the condition is determined by the etiological findings. Operable brain lesions should be referred to the neurosurgeon. The surgical indication may often be determined by encephalographic studies alone. If the seizures are due to scar tissue, the value of surgery is more doubtful, although some excellent results have been obtained since it has been observed that the post-operative scar forms slowly and is not as extensive. At any rate, the patient is entitled to careful study with this procedure in view. Some neurosurgeons have had excellent results with complete excision of the cervical sympathetic chain. Undoubtedly all pathology should be treated in all types of epilepsy, good hygiene should be introduced and proper exercise taken. Defects in posture should be corrected. A general wholesome diet with care not to overeat is valuable. Naturally, elimination should be carefully watched. Certain cases react well to a ketogenic diet, the theory of this diet being that the benefit which occurs is due to an acidosis caused by an incomplete combustion of the fatty acids. The patient is maintained on a high fat and low carbohydrate diet, the results being shown by the presence of ketone bodies in the urine which should be examined daily. The diet should be in the ratio of two to four grams of fat to one gram of protein and carbohydrate combined. The protein should equal one or two grams to two and one-half pounds of body weight. The diet should be sufficient to approximately maintain the normal weight of the patient. This diet is expensive and requires complete cooperation of the patient, since it is extremely monotonous. It may be necessary to continue the diet for a prolonged period of time. If the patient is free of convulsions for a long time, a general diet may be resumed.

Repeated spinal punctures have proved to be valueless. Dehydration with limited fluid intake and the use of magnesium sulphate in small doses every other day have proved of value in some cases. Again, complete cooperation of the patient is essential since discomfort is almost invariably present. Yet, some cases have been kept free of convulsions on this method alone.

Encephalography has at times relieved the patient for a time although no explanation for

this is given. Until the reaction is more thoroughly understood, it cannot be recommended as a therapeutic measure since there is still a small amount of danger present in the procedure.

Since complete cooperation of the patient is so often hard to obtain, medication is usually used to control the convulsion in non-operable cases. Naturally, glandular therapy is given in such cases where dysfunction is present. There is no curative drug but the patient can be made more comfortable if the seizures are controlled.

Bromides were used almost universally for many years. However, it is an extremely toxic drug in that it produces a definite rash in many individuals. Small doses of atropine seems to lessen the toxic effect in a few cases. Ten grains, three times daily, may be safely given and the amount doubled if bromidism does not occur. Examination of blood bromide does much to determine the tolerance of the dose, and should be done wherever facilities are available. Phenobarbital is the drug now most universally used. It is impossible to discuss the dosage since each case must be studied individually. The dosage must be sufficient to stop the convulsions, and the time of medication and amount must be determined by careful study. However, the initial dose is usually a grain and a half, given in the evening if the case is one of nocturnal epilepsy. It may be necessary to divide this dose during the day, or to increase it to as much as ten grains daily. The patient should be placed on the minimum amount which will control the seizures. For some reason the other barbitrates have not proven as effective. For the few persons suffering from an idiosyncrasy to this drug, bromides must be used.

Status must be treated as an emergency. A cleaning enema should be given. Sodium luminal, five grains intravenously, may stop the convulsions, this dosage being repeated in twelve hours if necessary. I have seen chloral hydrate given rectally react favorably in a few minutes. Spinal drainages may be attempted. If these methods fail, etherization must be resorted to in order, if possible, to save the patient.

The mental hygiene aspect must not be forgotten. These people are suffering from a con-

dition which gives them a definite feeling of inferiority. They need encouragement and every effort must be made to make these sufferers feel that they have a definite and important place in life.

HIRSCHSPRUNG'S DISEASE: (MEGACOLON)

JOHN BALLARD, M. D.*
Farnhurst, Del.

This paper is called forth by the presence of three cases in the Delaware Hospital, one of whom has since deceased. A perusal of the literature shows that a resume of megacolon was published in January 1926 in the American Journal of the Medical Sciences by Bartle of Philadelphia. From Dr. Bartle's admirable monograph we learn that as early as the 17th century a typical case was reported by Runyon. A number of other cases appear in the literature preceding Hirschsprung's paper, notably a report made by Dr. William E. Hughes of Philadelphia, May 27, 1886. Hirschsprung did not publish his paper until 1888.

Henry F. Formal in 1891 gave an account of a patient aged 29 who had a colon the size of a cow's. He cited the fact that after the removal of the forty pounds content of the colon, the colon weighed a little under seven pounds. The rectum appeared normal; the sigmoid was the portion most widely dilated. Death occurred suddenly while the man was attempting to defecate.

To indicate the rarity of true Hirschsprung's disease, we cite the published fact that from January 1908 to 1930 but 76 cases were reported by the Mayo clinic while in the ten-year period, 1920 to 1930 only 5 cases are on record as appearing at the Royal Infirmary of Edinburgh.

Wade and Royle, of Sydney, Australia, advanced the theory in 1927 most commonly accepted now as the cause of idiopathic as distinguished from acquired megacolon. They performed bilateral lumbar ramisections on thirteen patients, all of whom had spastic constipation, great relief resulted in eleven of the thirteen cases.

This result led them to believe that primary megacolon was due to imbalance of the autonomic nervous system in which the mechan-

ism for retaining the intestinal content overbalances the emptying mechanism. Acquired megacolon may be the result of any obstruction caused by anatomic factors, such as obstructing bands, aplasia of the musculature above the rectum, or faulty valves. Infective or malignant processes involving the intestinal musculature may also be etiologic factors. The three cardinal anatomic features found in this condition of the colon whether acquired or congenital are dilatation, elongation and hypertrophy.

Pathologically, in the idiopathic type, obstruction or other anatomic cause can not be demonstrated. In the acquired type the pathologic changes are secondary to obstruction. The sigmoid region alone shows involvement in about 33% of the cases, while the sigmoid with other portions of the colon account for 80% of the cases. The rectum, small intestine, stomach and esophagus may rarely be involved. Microscopically there is a thickening of one or all of the coats of the bowel plus an increase in size of the blood vessels and lymphatics. Associated there may be pressure symptoms on abdominal and thoracic viscera.

The main symptoms are obstinate constipation, abdominal distention, intermittent diarrhea, loss of appetite, emaciation and apathy. Typically these symptoms appear in the first few days or weeks of life and persist throughout the remainder of the affected person's days. In some cases pronounced symptoms do not appear until later in childhood or in adult life, a sort of a latent form. The extremes of age incidence may be from the seventh month of foetal life to eighty years of age. Usually the diagnosis is readily made from the history and clinical picture. The X-ray confirms the foregoing. Differentially megacolon must be distinguished from the ulcerations of a colitis, rickets, tubercular peritonitis, ovarian cysts, acute obstruction and annular carcinoma of the intestines.

Methods of treatment have varied considerably depending upon the findings in the individual case. The majority opinion inclines to some form of surgery if permanent results are to be expected. Particularly is this true in the acquired form of megacolon where anatomic factors are the cause. In the idiopathic form the surgical procedure has varied

*First Assistant Physician, Delaware State Hospital.

considerably; from complete excision of the affected colon to laparotomy with intra-abdominal manual breaking up of the fecal masses and milking them out through the rectum. Short circuiting and sidetracking operations have not been very successful. Royle of Sidney, Australia, was first to apply the method of lumbar gangliectomy, whereby the sympathetic nerve supply to the lower bowel is cut off. This type of operation is now employed by many surgeons and the results are superior to operations on the colon. The mortality is less and the period of hospitalization is definitely shortened.

Medical measures may be used with some success in mild cases. Mild laxatives and saline enemas may be effective over a considerable period of time. In more severe cases pituitrin and eserine may have to be used frequently and the colon may have to be emptied by mechanical means after thorough dilation of the rectal sphincter. Diathermy applied to the abdomen has been of help in some cases in increasing peristaltic action but the benefit disappears as soon as the diathermy is stopped. In some few cases the introduction of a dilating rubber bag after careful manual dilatation of the pelvi-rectal sphincter has been most successful. Bonar, of Salt Lake City, reports considerable success in one case by the repeated intra-rectal injection of a saturated solution of magnesium sulphate and suggests it as a preliminary medical treatment where for one reason or another immediate sympathectomy cannot be done.

There is another procedure that is of considerable interest. Since sympathectomy cannot be expected to yield results in any case of mechanical origin, Scott and Morton conceived the idea of using spinal anesthesia before operation to determine if a given case was one of actual autonomic imbalance; the idea being that it would isolate the colon from its central autonomic control and cause complete evacuation. They used the test in a case later submitted to sympathectomy, as well as in one case in which operation was contemplated but not done. They later reported the startling fact that this second patient, who did not submit to operation and who received only the test of spinal anesthesia, has remained well for more than four years with no addi-

tional treatment other than ordinary care of the bowels. Rives and Strug report two of their own cases benefited by this procedure and advance the idea that if Hirschsprung's disease be considered a vicious autonomic habit that spinal anesthesia by temporary arrest of the central autonomic control permits restoration of normal function. They believe that spinach anesthesia though it may have to be repeated at longer or shorter intervals is preferable to sympathectomy.

Naturally, when any marked physical complaint of anatomic deformity, congenital or acquired, is encountered in a hospital for mental diseases it is necessary before a diagnosis can be made to decide the role, if any, played by the purely physical disorder as distinguished from the mental state of the patient. Many types of mental illness are due entirely to an acquired or congenital disease, in others the physical illness may be but one of several exciting factors and in still others the physical condition and mental state play separate and distinct parts and no hookup can be successfully demonstrated. In 1930, D. M. Olkon and Hallard Beard published an interesting article giving an account of a patient who had Hirschsprung's disease, vesical incontinence and pupillary immobility. Their conclusion was that they were dealing with a post-encephalitic syndrome, the result of an encephalitis in early infancy, though neither the history nor observations gave any clue to the etiology. Never the less the visceral atony and vasomotor imbalance all pointed to a tonus disturbance of central origin.

Of the cases we have had at the State Hospital, Case I, J. W. was admitted in March 1934 and died in February 1937, at the age of sixty-six, of general paresis. Prior to December 1936 there was apparently no change in this patient's G. I. tract that would call for any special attention. He required occasional mild laxatives and low enemas. In December his abdomen began to noticeably enlarge and there was a generalized weakness present. There was no vomiting. Barium enema disclosed a descending colon three times the normal size with absence of haustrations. Repeated dilatations of the pelvi-rectal sphincter, plus pituitrin and irrigations were necessary from then on to empty the colon. In this case

there could be but little doubt that the megacolon was acquired and due to a central disturbance of luetic origin.

Case No. 2, M. G. was admitted to the hospital in September, 1933, at the age of 21. The social history states that she was always a sickly child. For several months before admission she complained of frequent urinations and "some irritation around the rectum." Physical examination at the time she came in was essentially negative so far as the G. I. tract was concerned, though she did give evidence of some endocrinopathy. Later progress notes indicates that she was a feeding problem and often required laxatives. It was not until November 1935 that there appeared any change in her abdominal condition. At this time she began having diarrhea like stools though they only occurred once a day. A nodular, irregular mass was at times palpable in the left lower abdominal quadrant; this varied in size and occasionally could not be palpated at all. X-ray studies were made and showed the presence of a tremendous dilatation of the sigmoid and lower colon. The diagnosis of megacolon followed. This apparently is a mild case as to date the patient has been kept in a satisfactory condition by means of a nutritious and easily tolerated diet—low in residue, mild laxatives, and occasional cleansing enemata. Recent barium studies show practically no change in the megacolon. It is interesting to speculate in this case as to whether this apparent more or less inactive type of Hirschsprung's disease has not been responsible to a considerable degree for the patient's mental illness. It is an accepted fact that many patients with megacolon are quite neurotic and it is easy to have a secondary psychoneurosis in addition to the real pathology. Her social history indicates that she was a nervous and sickly child and that as she grew older she became more seclusive and asocial, finally developing a definite schizophrenia. Was there at an early age a slight imbalance of the autonomic system with more or less colonic irritation and a low grade toxicity? This in turn causing ill health and a turning in of the patient's interest with resulting social maladjustment. It is a point that deserves considerable study.

Case No. 3, L. L., a seventeen-year-old male who entered the hospital in February, 1937.

The social history states that ever since the patient was an infant he has been troubled with nausea. He appeared to be healthy otherwise and never had any serious illness until the present time. About a month before admission he complained of nervous indigestion and several days later he apparently had severe pains in his abdomen. He would bend over in a crouching position to secure relief. These attacks of pain became more frequent and severe and he began expectorating accumulations of saliva. One physician diagnosed his trouble as dyspepsia. Various forms of magnesia were prescribed and gave some relief and he was put upon a diet. During this time his mental state became correspondingly worse—he became depressed, irritable and inclined to violence during the periods of pain. When removed to a private hospital he had to be put in restraints because of his unruly behavior. Because of the history and the fact that the patient often complained of having a "lump" in his lower abdomen though none was ever palpated, a G. I. series was made shortly after admission and disclosed a large dilated descending colon and sigmoid due to Hirschsprung's disease. Patient was put on a proper diet, mineral oil has been given daily and a saline cleansing enema each evening. He has not had any pain since this regime was initiated and there has been no further enlargement of the colon. However, his mental condition remains far from satisfactory.

In the two later cases more active treatment is soon to be instituted, particularly the spinal anesthesia is to be given a trial. It is hoped that in a future paper it will be possible to give a report of more decided progress toward a permanent relief or a cure of this interesting and rare anomaly.

WIDE SPAN PSYCHOMETRIC PATTERNS

An analytical review of 90 children selected for extensive range of inherent intelligence components as a preliminary study of the possible relationship between intellectual types and forms of maladjustment.

CLAUDE UHLER, M. D.*
Farnhurst, Del.

A battery of psychometric tests reveals facts about the way a child thinks and learns. The

*First Assistant Clinical Director, Mental Hygiene Clinic.

findings are interpreted against a background of complex determinants. This gives the functioning level of intellectual effectiveness.

In addition to identifying capacities, the tests throw light on skills or difficulties not demonstrated by simple I. Q. alone. Methods and materials are codified in the I. Q., but the technique employed in their use, varies with habits of work and mobility of temperament. Individual skills and basic temperaments account for wide discrepancies in psychometric patterns of individuals, even when they possess similar intelligence. The I. Q. is not so much a physical characteristic as it is a symbol of efficiency. It is constant within certain limits, and it is developed and utilized differently for each person, even among those with identical quantities.

Intelligence plays a part in normal behavior. What role does it play in abnormal behavior? The behavior of the "feeble-minded" or the "insane" or the "criminal" is fairly characteristic. Intelligence factors in the behavior of these separate groups have been studied. One wanted to know—What is the average intelligence of the habitual offender, "the moral imbecile," the young delinquent? The neurotic show signs of his instability in the psychometric pattern. The praecox shows his deterioration. In possession of these patterns to start with, it is reasonable to look for certain kinds of behavior deductively when these patterns reappear over and over again. A subject is believed to be feeble-minded or seriously unstable or deteriorated from the intelligence scale alone.

There are factors in the temperamental style of persons which must correlate very highly with intelligence because investigators, after some years experience, can suspect almost within the limits of normal variability just what a subject's Binet intelligence is in the course of a single psychiatric interview. It has been impossible to "guess" in this same way, psychomotor ability. Some skills are revealed in the apoerisiary of a psychiatric interview, others are not. Going back and forth from patterns to behavior, and from behavior to patterns, questions were provoked.

(1) Does a certain kind of behavior accompany a certain kind of ability as shown by the psychometric?

(2) Are basic temperaments, such as constitutional predispositions, linked up in any way with inherent abilities?

(3) Is there any relationship between types of maladjustment and types of psychometric disabilities?

(4) Can any prediction be made from a study of a battery of psychometric tests about the form of nervous disorder to which a person might be liable?

These questions are not far fetched. As the career of maladjusted children is reviewed in perspective, over a number of years, a definite eogeneity of intellectual influences seems to crystallize in the development of the behavior pattern.

Interest in these questions prompted the investigation of cases which showed the most extreme range in abilities, as determined by standard verbal and performance tests, in the belief that differences in other correlating personality components would stand out in better relief, the greater the intellectual disparities. This study is confined to children of school age. One group displays high psychomotor dominance, the other high verbal dominance. Cases were selected as representative of an extreme span of inherent ability. For this reason no anergasias, such as cerebral injury, toxic or infectious conditions, or physiological dysfunctions could be used. Also care was taken to eliminate those children where a foreign language was spoken exclusively in the home, because this factor alone may cause discrepancies which could not be considered inherent. In this manner the psychometric patterns could be regarded as much a part of the personality fabric as constitutional predisposition and temperament.

MATERIALS USED

Each child has received complete psychiatric and physical examinations, home investigations, social histories, and a battery of psychological studies. These studies consisted in all cases of the Stanford or Herring Revision of the Binet-Simon Test, and one or all of the Standard Performance Tests, such as the Grace Arthur, the Army or the Cornell-Coxe Performance, and in addition, various achievement tests, diagnostic studies, and the Maller or the Rogers personality studies. The majority of the cases have been under observa-

tion for from two to seven years. Only a few, which fell in the delinquency group, examined at the Juvenile Court, had a single day's study. Even these cases received social service checkups on probation.

The study covers 90 cases. A review of 820 cases was necessary for the selection of the 90 cases which received intensive enough attention to meet all requirements. First, cases were selected for predominance in psychomotor ability with wide disparity over their verbalist ability. Then, cases were selected for predominance in verbalist ability with wide disparity over psychomotor ability. Arbitrarily a span of twenty points was set for the psychomotor dominance group of 50 cases; since the verbal dominance cases were much more scarce, a ten point span was set for this group of 40 cases; in fact about all that could be found.

In the analysis the two groups are weighed against each other and against corresponding aspects of total Clinic population. Findings are recorded under the following headings:

- I General considerations (Age, school progress, etc.)
- II Reasons for Referral.
- III Psychometric Factors.
- IV Hereditary Psychopathic Determinants.
- V Physical Developmental Defects.
- VI Constitutional Types.
- VII Reaction Types.
- VIII Conclusions.

I. GENERAL CONSIDERATIONS

Since the children were all of school age, ranging from six to eighteen, observations were made to establish uniformity or difference on this score, as the case may be. Age factors and educational progress could alone account for so much difference in patterns of behavior or forms of maladjustment in the two groups, as to make comparisons worthless.

TABLE I

Age Range	Psychomotors	Verbalists
	6 yr. 10 mo. to 17 yr. 8 mo.	5 yr. 10 mo. to 18 yr. 0 mo.
Average age	13 yrs. 4 mos.	14 yrs. 3 mos.
Median age	14 yrs.	15 yrs.
Median grade	5th	5th
Years Retarded	2	2 yrs. 7 mos.
Average		
Median	3 yrs. 4 mos.	3 yrs.

Among the psychomotors, more than 50% were in the 4th, 5th, and 6th grades. Thirteen children were 0 years retarded. Only 7 were

retarded more than 4 years. Four were in special class—12 in Trade School.

Among the verbalists, about 50% were in the 6th, 7th, 8th, and 9th grades. Four were 0 years retarded. Seven were retarded more than 4 years. Ten were in special class—12 in Trade School.

There is a remarkable uniformity in the figures of both groups. The verbalist dominance group averaged one year more in chronological age, and had progressed to higher grade levels. They also showed a corresponding slightly lessened retardation. In school standing the verbalist scored higher.

II. REASONS FOR REFERRAL

TABLE II

	Psychomotors	Verbalists
Retardation	26	40
Personality Defects	16	55
Delinquency	48	22
Dependency	8	12
Nervous Habits	2	2

Although a majority of the psychomotors were non-readers, the delinquency referrals outnumbered retardation. It must be kept in mind that a number of children were referred each with two or three problems, but delinquency by far dominated group I.

One noteworthy deduction can be made. The three major problems, delinquency, retardation, and personality defects, were exactly reversed in the order of their incidence in the two groups. The psychomotors were high in delinquency and low in personality defects. The verbalists were high in personality defects and low in delinquency. Reasoning along the line of child protests, leading on the one hand to rebellion, and on the other hand to neuroses, it would seem that the psychomotors are inclined to rebel as a favorite motor response and preserve their ego integration; the verbalists conform and suffer neuroticisms.

III. PSYCHOMETRIC FACTORS

Considerable precaution needs to be exercised in weighing I. Q.'s against each other in the two groups. They are diametric opposites selected on that basis. However, the psychomotor ratings and the verbalist ratings can be compared with each other in both groups. The most stable I. Q. in each case over the entire period of study was used in each type of ability. The Clinic policy for classification, nominates I. Q. 70 as the upper limit of mental de-

iciency. All I. Q's are computed on the 16 year maturity basis.

TABLE III

	Psychomotors	Verbalists
Discrepancy Range	13 to 52 points	7 to 35 points
Discrepancy Avg.	26	17
Psychometric		
A. Performance		
I Dull normal plus	98%	18%
II Borderline	2%	8%
III Feeble-minded ...	0%	74%
B. Binet		
I Dull normal plus	16%	40%
II Borderline	36%	45%
III Feeble-minded ...	48%	15%
Non-readers	30 cases	4 cases

Among the psychomotors, 30 out of the 50 cases were diagnosed Special Reading Disability on the basis of standard diagnostic tests. Eleven cases were seriously retarded in language functioning, as determined by the Stanford Achievement Tests and Wallin Attainment Scale. Only 9 children could read well.

Among the verbalists, four were non-readers. In others who were seriously retarded in school, arithmetic was the worst subject, according to teachers' marks.

An analysis of these test results brings out some interesting items. In the psychomotor dominance group, most children were non-readers or serious language function retardates. In only five cases did the children come from foreign born parentage. These cases were included in the group because the English language was spoken regularly in the home.

In the verbal dominance group there were also some non-readers, numbering 4 out of the total 40. None were children of foreign born parents. There were 4 cases of foreign parentage with retarded language functioning, but not with a special reading disability, with its characteristic symptoms.

In discussing intelligence levels, it is the Clinic policy, based on careful considerations of general adaptability as well as single test results, to classify levels of intelligence according to the highest ability displayed by any one standard test in the battery.

In the verbal dominance group only 32% rated average or near average. Yet this group had a slightly higher grade attainment and less educational retardation.

One finding stands out as a warning in this analysis. If the Binet test had been used alone in the first group as a routine procedure,

48% of average intelligence children would have been passed as feeble-minded.

Another item is very interesting here. Where the gross disparity lies in favor of psychomotor ability, no cases are feeble-minded. In those cases where the disparity favors verbal intelligence, 15% are feeble-minded. Therefore, in this particular, group I is definitely more efficient.

It should be pointed out that by control against the total new cases of school age accepted by the Clinic for the past biennium, the first group rates very high with its 98% of about-average intelligence cases. The members of the second group rate about the same level, namely, 40% of dull average (or upward) intelligence.

IV. HEREDITARY PSYCHOPATHIC DETERMINANTS

Investigators have pointed out from time to time, especially in the foreign literature, the presence of feeble-mindedness among the progenitors of non-readers. As there are so many non-readers in this survey, a check was made of family history and the presence of feeble-mindedness and psychoses.

A strongly positive history of psychopathic taint ran in both groups. Over half of the cases had definitely psychopathic forbears within the third generation. There was also uniformity in the incidence of feeble-minded and psychopathic siblings, 25% and 23% respectively, in groups I and II.

V. PHYSICAL DEVELOPMENTAL DEFECTS

Following out this lead of constitutional influences, the personal history of each case was reviewed for defective development, motor instability, and nervous habits, such as persistent enuresis and nail biting.

GROUP I

52% had clear cut developmental defects.

GROUP II

48% had clear cut developmental defects.

In the incidence of speech defect, group I had 16 congenital cases, and group II had 15 cases.

A larger percentage of developmental defects occur here than for any other class of total Clinic population, except the outright feeble-minded. It is noticed also that there is a marked uniformity here in the two groups. This again suggests constitutional influence.

VI. CONSTITUTIONAL TYPES

It is not necessary to evoke the Humors of the Greeks to defend the position that persons were born with temperaments that influence their behavior. The fatalism of implying end results apriori, from primary constitutional types, probably accounts for the skittishness about classifying constitutions in any behavior study. The terms "Intravert" and "Extravert" are suffering mistreatment in this way by deductive reasoning.

Personalities should be discussed in such simple understandable terms as to give fairly uniform pictures to everyone. Paraphrases and popular clichés have converted portrait painting of temperament into a form of Dadaism or Surrealism. A quotation from Sir William Temple, the teaching master of Jonathan Swift, is pertinent. From his "Essay on Gardens," written over 250 years ago—"As men of several languages say the same things in very different words, so in several ages, countries, constitutions of laws and religions, the same thing seems to have been meant by very different expressions; what is called by the Stoics, apathy or depression; by the Skeptics, indisturbance; by the Molinists, quietism, seems all to mean but great tranquillity of mind."

With simplicity as a goal, the temperamental makeup of children is considered here under two primary headings, —Mobile and Immobile, terms borrowed directly from psychological findings of the children in action on standard tests. It was found that the psychological reports about the temperamental mobility or the temperamental immobility displayed in the course of the test corresponded so well with descriptions of the child's behavior in the community at large and with his reactions during psychiatric interview that the subject of mobility of temperament came to be the by-word. It was easy to go from this to the recognition of several kinds of mobility and immobility—(1) quick, (2) light, (3) deep mobile temperaments, and (1) stiff, (2) weak, and (3) slow immobile temperaments. By further eclecticism, their corresponding synonyms are given as, quick—erethismic, light—egertic, deep—impassioned in the mobile group; and stiff—stoic, weak—inadequate, and slow—phlegmatic, in the immobile group.

It has been found, for instance, that some degree of immobility of temperament is an advantage in the exercise of certain skills in the psychometric tests. On the other hand, a too great mobility of temperament interferes. In this classification mobiles and immobiles have an entirely different meaning from extravert and intravert as ordinarily applied to social behavior. This scheme of pigeon-holing, even though misleading in the extreme, at least has the advantage of dealing with inherent predispositions in a positive way with no ominous implications of impending mental disease or social rupture.

TABLE IV

	Psychomotors	Verbalists
Mobile		
Quick	36%	20%
Light	12%	12.5%
Deep	26%	35%
Immobile		
Stiff	12%	2%
Weak	8%	18.5%
Slow	6%	12%

An analysis gives some indication about the kind of skills most frequently displayed in the various temperaments. There were more quick mobiles in the psychomotor group than in the verbalist group. Most of these children had a fairly facile speech. A high vocabulary did not necessarily go with a glib tongue. The quick mobiles made up 36% of the psychomotors, but none of these scored well on verbalist ability.

There is a greater number of the weak suggestible children in the verbalist group. The inadequate personality type leans toward the verbalist dominance, even though it may be a weak one. The psychomotor skills call for initiative and original planning. These qualities are lacking in the inadequate type.

The smallest percentages in the psychomotor group appear in the light mobile and the weak and the slow immobile types. The light mobile, representing the overactive, outgoing, shallow temperament, could hardly be expected, in its extreme forms, to exercise efficiently such a skill, for instance, as that required in the Porteus Maze.

Looking at the psychomotor column, the deep mobile and the stiff and slow immobile types make up 54%. These are the "social intraverts" of the group. Such children are not so seclusive as they appear; exclusive perhaps;

inwardly responsive and quietly appreciative and sensitive, but not overtly expressive. A narrow majority of the psychomotors are socially intraverted. These children are not handicapped by the possession of this trait when they are doing performance tests.

One fact stands out. The costive temperament, which largely typifies the deep mobiles and the stiff and slow immobiles, is conspicuous in children with wide disparities in either direction, almost 50% of each group.

VII. REACTION TYPES

In the preceding division the cases were treated in the relationship between fundamental constitutions and inherent abilities. They will now be considered from the standpoint of adjustment. Many children in both groups were found to be adaptable in their personality structure with the help of very slight educational and social re-arrangements. Some had improved considerably under treatment at the Clinic. Others became adaptable under the guidance of social agencies or under institutional discipline. The subject of progress and treatment is beyond the scope of this paper. Here, the cases are treated according to the incidence of adaptables, unstables, "psychopaths" and schizoids in the two groups. The table follows:

TABLE V

	Psychomotors	Verbalists
Adaptable	42%	23%
Neurotic	18%	15%
Schizoid	8%	35%
"Psychopath"	22%	16%
Instability	10%	11%
Prepsychotic	10%	22%

A very striking finding is that 58% of the psychomotors and 77% of the verbalists were distinctly abnormal personalities in one form or another. Compare this with the 33% abnormal personalities among the total 1647 new cases accepted by the Clinic for the past biennium. In the first group, where non-readers predominate, 20 of the 29 children who fell in the abnormal personality class had become abnormal only after they started to school. This item illustrates the strong environmental aspect of the reaction forms which operate in the psychomotors, as distinguished from the verbalists where the reaction tends to integrate deeply into the personality structure.

From the standpoint of adjustment, it is very interesting to find that 42% of the psy-

chomotors are adaptable against only 23% of the verbalists.

Just a word about the schizoids. They included children with episodes of violent incongruous acts, children with continued shallow inconsistencies and inappropriate moods and actions, and those with serious delusional and hallucinatory distortions.

The schizoids rated lowest of all types in the psychomotor group; they rated highest of all types in the verbalist group.

There were five definitely prepsychotic children who displayed psychomotor dominance; there were nine definitely prepsychotic children who displayed verbalist dominance.

VIII. CONCLUSIONS

Bearing in mind that the study concerns itself with I. Q's primarily and children secondarily, the enterprise frequently utilizes logic by immediate inference. If allowance is made for these technical devices, the following conclusions will be worthy of consideration.

(1) Wide span disparities between verbal and psychomotor intelligence are very rare. Only one in sixteen out of a panel of eight hundred and twenty extensively studied cases had a span of more than twenty points favoring psychomotor dominance. Only one in twenty had a span of more than ten points favoring verbal dominance. Ninety cases in all were selected for this study.

(2) Children with higher psychomotor ability were referred mostly as delinquent problems; least of all as problems of personality defect. Children with higher verbal ability were referred mostly as personality defects, with delinquency coming lowest, exactly the reverse.

(3) One half of the children with psychomotor dominance of average intelligence would have been labeled feeble-minded if only the Binet test had been given.

(4) A special disability in reading was conspicuous in the low Binet intelligence group.

(5) There is a very strong hereditary psychopathic taint present in the family histories of children with wide span disparity, closely parallel with the primary feeble-minded in the total Clinic population. Congenital developmental defects, nervous habits, and dyskene-

sias were present in over half the cases. One in six children had serious speech defect.

(6) In the study of constitutional types, it was indicated that, within normal limits, mobility of temperament is an asset in the exercise of psychomotor skills. In excess, it is a handicap.

In the process of balancing the extremes of the skills against each other, it was apparent that the social "intravert" predominates among the psychomotor extremes. The so-called inadequate personality is more common to the verbalist types.

It was suggested that oxylalia, or glib speech, bears little correspondence to verbal intelligence. Vocalism is not an indicator of verbalist ability.

Due to the highly subjective element which operates in the interpretation of temperament and to the loss of individualization through the process of typing, it is hazardous to draw correlations between constitutional types and inherent abilities unless conclusions allow very broad implications.

No distinct temperamental type is peculiar to either disparity. However, on this topic, the review definitely discloses the fact that children of the withdrawn, impassioned, the rigid inflexible, and the weak and the inadequate temperaments, combined to include the social intraverts of both groups, constitute about one-half of the cases.

(7) There is a very strong trend toward the development of serious personality defects and psychoses among children with wide disparities, especially when the psychomotor ability is the lower. It is in this group also that the emotional instabilities and schizoid reactions predominate.

THE USE OF ENCEPHALOGRAPHY IN THE DELAWARE STATE HOSPITAL

BERTRAND G. LAWRENCE, M. D.*
Farnhurst, Del.

In the two years between April 5, 1935 and April 1, 1937, 58 spinal air injections have been performed at the Delaware State Hospital. Previous to 1935 the procedure had been employed in a few scattered cases. Its use in this institution is rapidly growing, so that in

1937, inclusive of April 1st, twice as many injections had been done as during the entire year of 1935.

Encephalography is employed primarily as a diagnostic measure in attempting to discover intracranial pathology. Not infrequently, however, encephalography has resulted in relief of symptoms, and functional improvement, so that air injection is sometimes done with the hope of therapeutic gain predominantly in mind. In either case, however, the object is the removal of cerebro-spinal fluid and its replacement with some medium which in the X-ray plate will give contrast so that the ventricles and subarachnoid spaces of the brain will be delineated. The medium most commonly used is air, and the process is sometimes termed pneumoencephalography.

The following preparation is standard for the average adult and is varied to fit individual cases. One hour before the procedure is scheduled to begin, 3 to 6 grains of sodium amytal is given by mouth. Forty-five minutes later, morphine sulphate one-fourth grain, and hyoscine hydrobromide one-100th grain is given by hypodermic injection. Food is withheld for several hours beforehand, but water may be taken freely. In only one case of this series was a general anesthetic necessary because of failure to cooperate. In this case Evipal was given by intravenous injection.

The apparatus employed in this series is described as follows: It is the simplest form of closed system apparatus and was developed in the Department of Neuro-Psychiatry of the State of Wisconsin General Hospital. It is a graduated glass tube with a capacity of 200 cc., made with an open nipple at either end over which the plain end of a rubber tube may be forced. The other end of each rubber tube is equipped with a coupling which fits tightly into the hub of a lumbar puncture needle. The lower rubber tube is interrupted by several short lengths of glass tubing inserted for the purpose of following the flow of fluid before the rubber tube is completely filled. This rubber tube is of such length and caliber as to contain approximately 10 cc. of fluid when completely filled. The length of the upper rubber tube is not important except that it should be sufficient to insure freedom of move-

*First Senior Assistant Physician, Delaware State Hospital.

ment of the glass container. This tube may also have a glass insert so that a back flow of fluid along this tube may be detected. The entire system when assembled must be air-tight. The patient sits on a stool and is allowed to rest the head on a high table. After surgical preparation of the skin, lumbar puncture needles are inserted, usually between the third and fourth, and fourth and fifth lumbar vertebrae. The stylet is removed from the lower needle and a manometer attached to determine the fluid pressure. The manometer is removed and the coupling of the lower rubber tube inserted firmly into the hub of the needle. As soon as the fluid fills the rubber tube and begins to flow into the glass container the stylet is quickly removed from the upper spinal needle and the coupling of the upper rubber tube made fast into the hub. Then as fluid rises in the glass container air is forced out through the upper rubber tube into the spinal canal, so that there is a continuous interchange of fluid and air without fluctuation in intraspinal pressure. The speed of flow may be regulated by raising or lowering the glass container. Usually all the fluid obtainable is removed, the position of the head being occasionally changed slowly to completely empty the ventricles. The complete removal of fluid usually is indicated by the sudden appearance of air at one of the glass inserts in the lower tube. The needles are then quickly removed, sterile dressings applied to the puncture wounds, and the patient taken directly to the X-ray room, where antero-posterior, postero-anterior, and right and left lateral views of the head are taken. The patient is then put to bed and made as comfortable as possible. Food and fluids are given as soon as tolerated. There is usually a slight elevation of temperature during the first 24 hours. The patient in most cases is able to be up after four to five days. There is rarely a persistence of headache for a longer time. It is interesting to note that the headache following encephalography rarely lasts as long as the headache which frequently follows a simple lumbar puncture with removal of a few cc. of fluid.

The method described above has been used in all cases except children, who frequently are restless and struggle during the early part of the injection. Excessive movement is likely to displace one of the needles, particularly

since the attached rubber tubes have considerable weight. In these cases, therefore, we are more likely to use the old method by which fluid is removed in 5 to 10 cc. quantities and air in equivalent quantities injected by means of a glass syringe through a single needle. Connection is made between needle and syringe by means of a 6" length of very flexible rubber tubing provided with fittings at either end to allow attachment to the spinal needle and to the syringe. This, however, is a much more tedious process, and the variations in intraspinal pressure add to the discomfort of the patient.

In a small percentage of cases there is failure of air to enter the skull, even though the spinal canal may be filled. Experience appears to indicate that if an ordinary lumbar puncture has been done within ten days preceding attempted encephalography difficulty of this kind is more likely to be encountered. The spinal fluid pressure under these circumstances is usually found to be definitely lower than normal. Sometimes, however, this type of failure occurs without any apparent explanation. In this series five attempts resulted in this difficulty. One of these was attempted a few weeks later with complete success.

Localization of injected air in the sub-dural rather than the sub-arachnoid space is encountered occasionally. At times there is also filling of sub-arachnoid spaces and ventricles, but in rare instances the air appears almost entirely sub-dural and may result in difficulties of interpretation unless this possibility is kept in mind. The reason for this abnormal localization of air is not always clear, particularly in cooperative adults. It is seen very frequently, however, in children who have struggled violently during the injection. The sub-dural localization of air is believed to be of benefit in certain cases of post-traumatic headache.

Where interpretation must be made from flat plates the position of the head during X-ray exposure is important. In the antero-posterior or postero-anterior views slight rotation of the head will result in distortion of the ventricular shadows, which may make it impossible to interpret the plates.

The amount of fluid removed varies through wide limits. Occasionally in an uncooper-

ative child the removal of 25 to 30 cc. and replacement of an equal amount of air may result in pictures which show sufficient filling of the ventricles to determine whether or not they are of equal size and symmetrically placed. The largest amount of fluid removed in this series was 300 cc. in a case of internal hydrocephalus in a normal sized skull. In the average adult we expect to obtain from 125 to 150 cc. fluid. Five to ten cc. less air is injected to partly compensate for the tendency to increased pressure which exists until the air is absorbed.

Encephalography is considered to be quite safe, special precautions being necessary in rare instances. Where there are evidences of greatly increased intracranial pressure the spinal air injection might be inadvisable because of the possibility of herniation of the medulla oblongata into the foramen magnum. No such case, however, is included in the present series. There has been no death in this series attributable to the encephalographic procedure. All patients in this series are living except two, one of which was a case of brain tumor diagnosed by means of the encephalogram, the patient being, however, in such serious condition that he died a few weeks later from the effects of the tumor. Another case was found dead several months after encephalography, apparently a suicide.

Patients in our series range in age from less than three years to sixty-one years. Ten of them were under ten years of age. Two brain tumors, one of frontal lobe, the other of temporal lobe, were diagnosed by means of encephalography. One diagnosis was confirmed at autopsy, the other at operation. A third diagnosis of tumor was made from neurological examination. From encephalographic plates, however, a tentative diagnosis of subdural hematoma was made, and this diagnosis was confirmed at operation. In one case with defective vision and mental deficiency the skull was very large, suggesting hydrocephalus. X-rays, however, showed the ventricles to be smaller than normal, symmetrically placed, the picture suggesting megalencephaly or diffuse hyperplasia of the brain. There were eight cases of arrested mental development with spastic signs. In five of these the X-rays were essentially negative, one showed

generalized cerebral atrophy, one showed internal and external hydrocephalus, and one gave evidence of a moderate degree of cerebellar atrophy. A thirteen-year-old boy showing signs of beginning acromegaly had an essentially normal encephalogram. In a case of severe head pain in which chronic lead poisoning and early brain tumor were considered as possibilities the encephalogram was normal. Two cases diagnosed chronic encephalitis had normal encephalograms. In the case of a girl eighteen years of age, mentally retarded, plain X-rays of the skull showed calcified areas in the brain. Encephalogram showed calcification to be in the choroid plexuses, the X-rays being otherwise negative. A woman with paralysis of the extremities, much more severe on one side than the other, with indefinite history of head injury preceding the onset, was found to have a marked internal hydrocephalus, 300 cc. fluid being obtained. Sixteen cases of epilepsy were included in the series, three with definite history of head trauma. Of these three, one showed diffuse cortical atrophy, one in which a craniotomy had previously been done showed the expected distortion of ventricles due to this operative procedure, and one was roentgenologically negative. Of the others without history of head injury, two showed generalized cerebral atrophy, and one showed localized atrophy which upon operation was found to be due to a circumscribed cerebral scarring. Porencephalic cysts were disclosed by X-rays in three cases, internal and external hydrocephalus of moderate degree in one case. X-rays were negative in six cases, and there was failure of air to enter the skull in two cases. There was definite objective improvement following air injection in three cases, with lessened frequency and severity of convulsions. In one of these there was gradual return to the previous condition, repeat of the air injection resulting in no further improvement. This report of improvement in epileptics must be considered extremely conservative, since many of the cases have not been closely followed since air injection, and others have been done too recently to determine positively whether there has been improvement. Several patients who showed no definite change in tendency to convulsions have reported subjective improve-

ment and have insisted that the procedure be repeated after several months or a year.

Sixteen cases are included in this study having definite history of head trauma. Six of these complained of severe headaches of long standing. Of these six three were roentgenologically negative and reported no relief following the injection of air. One case mentioned above was diagnosed sub-dural hematoma, with operative confirmation of diagnosis and relief of symptoms. One case with a history of severe head trauma many years ago had complained of disabling headache ever since the time of the injury. X-rays showed a remarkable degree of generalized cerebral atrophy. Part of the air was sub-dural. After recovering from the immediate effects of the air injection the patient reported complete cessation of headache, which has resulted in a change in his mental attitude, together with great improvement in his economic situation because of his present ability to work steadily. Another somewhat similar case with a history of more recent injury also shows marked cerebral atrophy, but there has not been sufficient time since encephalography to determine whether there will be similar improvement. A child with a history of birth trauma with arrested mental development showed unilateral cerebral atrophy of moderate degree. Two cases with epileptiform convulsions due to head trauma showed no X-ray evidence of brain injury, but both were improved after air injection. In four other cases with history of trauma but without symptoms attributable to head injury encephalograms were negative.

This series includes one case of general paresis, whose serological findings established his diagnosis after the encephalogram had been done. The X-ray showed fairly marked diffuse cerebral atrophy, with no air in the ventricles. There was extremely rapid improvement in this case, the credit for which, however, is not claimed for the air injection, since he was immediately put on intensive anti-syphilitic treatment, including hyperpyrexia.

CONCLUSION

It will be seen that even this small series contains cases of interesting variety. The procedure, by its very nature, is fascinating to

the operator. The increased frequency of its employment is fully justified by the diagnostic aid afforded, and the therapeutic results obtained. The foregoing is a rather general survey. The rapid increase in the series will afford opportunity for future studies of more specialized nature.

A PSYCHIATRIC PROBLEM WHAT NEXT?

A. L. CRANE, M. D.*
Farnhurst, Del.

The purpose of this brief article is to point out a problem with which the writer has been repeatedly confronted while doing psychiatric work in the correctional institutions of Delaware.

The problem is this: What, if anything, should the State do about those inmates of its correctional institutions for juvenile offenders who are about to be released to the community because they shall have attained their twenty-first birthday, in spite of the fact that all competent opinion—administrative, psychiatric, and social—is agreed that they are definitely anti-social and constitute a real community menace?

Under existing practice these adolescents, who have run afoul of the law prior to their seventeenth birthdays, are committed to the appropriate correctional institution by a Juvenile Court Judge whose commitment is automatically null and void when the offender shall have attained his majority.

Happily many of these young people—the majority perhaps—are so greatly benefited by the excellent work done in these correctional institutions of the State that they may safely be and are returned to normal happy community life. But this is not the group we are thinking about now.

What of the "uncorrected tenth"? If they show evidence of mental disease, the proper authorities may, in their discretion, effect their admission to the State Hospital where supervision over them may be retained as long as professional opinion indicates its necessity. Well and good. If the individual be mentally defective, his commitment to the Delaware Colony at Stockley offers the State a simple means of protection against the almost inevit-

*Second Assistant Clinical Director, Mental Hygiene Clinic.

able future criminal activities of the members of this group.

But obviously the majority of these individuals are neither feeble-minded nor insane.

Nevertheless, regardless of their proclivities, upon the advent of a certain point in time, they are set loose upon a community which is as unsuspecting of them as they are incapable of adjusting to it.

What does it profit the State to employ psychiatrists to pass judgment upon these individuals and to advise of their potential danger to the safety and welfare of its citizens when all concerned must stand impotently by while the proven criminal is granted his liberty to pursue his course among us?

But perhaps you will say: He has served his time. He deserves his chance. And besides, how can you be sure he will not mend his—or her—ways? In reply we can only say that the welfare of society must always be placed above that of the individual and while we cannot be mathematically certain that a given individual is going to be anti-social in the future, we *can* be relatively sure of it, sure enough, in many instances, to predicate our opinions and actions upon such a conviction.

Who, for example, would venture to disagree with such an opinion in the case of:

CASE 1. George is a colored boy—or man—who will be twenty-one in the Fall. Physically he is a great hulking individual with a well-developed musculature, though he does have a valvular heart condition. Intellectually he is of borderline intelligence, his I. Q. rating being 79. In 1927, when he was but eleven years old, he first appeared in the Juvenile Court for breaking and entering but the charge against him was dismissed. In 1932, when he was sixteen, he was committed to the Industrial School because his mother could no longer put up with him at home. He was impudent, refused to attend school, and entirely disobedient. During his course at the institution he has, on many occasions, been given jobs outside in the hope that he would make good. He has failed time and again, being regularly either discharged after a period of a few days to a few weeks for inefficiency or sometimes simply dropping his job. Recently he has acquired a venereal infection. He is described by his cottage master as tardy, in-

attentive, mouthy, and refusing to do any work which does not interest him. When interviewed by the writer he was antagonistic and belligerent and, while he made no definite threats as to what he will do when he is released, his sullen attitude and feeling of security because he realized that we are powerless to hold him but a few months longer certainly gave the examiner anything but a feeling of confidence in his future course.

CASE 2. Another case in point is that of Helen. This girl is a rather severely plain appearing young white woman who will also soon be twenty-one. Physically her general condition is fair though she is suffering from both gonorrhea and syphilis. Several years ago she supported herself in a nearby city as a prostitute. Her intellectual capacity is just a trifle too high to make her legally eligible for commitment to the Delaware Colony for Mental Defectives. Nervously she is somewhat unstable and her personality is anything but attractive. She is described by the Superintendent of the institution to which she was committed as a defiant, sullen girl, untruthful and resistive to discipline. She is self-willed and irritable. When examined by the writer she was approximately three months pregnant, a matter which she considered strictly her own concern. With us she manifested the same sullen defiant behavior which the superintendent had mentioned and, when asked what line of work she intended to follow upon her release, she blurted out in no uncertain terms, "A prostitute," (except that she used somewhat less conventional English) and added by her tone of voice, "and what are you going to do about it?"

And thus we might continue until we had presented a very considerable number of cases, approximately five percent—of the inmate population of the correctional institutions of the State.

Before closing this brief article it seems in order to mention the fact that in discussing this situation with the heads of the correctional institutions of the State, we discover that each of them had had the experience of predicting concerning certain of their charges that they would become anti-social on release, only to have this opinion verified at a later date by the facts.

What shall we do about it? The problem is a real one. By the time this article is printed one or more members of this group shall have been released and you or someone near and dear to you may be the innocent victim of his unfortunate habits.

The psychiatrist's task begins and ends with the identification of the individuals who quite definitely belong to this group which we have considered—and with the pointing out of the problem. Its remedy does not lie in his province.

RESEARCH IN SCHIZOPHRENIA DURING 1936

J. K. MORROW, M. D.*
Farnhurst, Del.

Most of the research work on schizophrenia during the past year has been in continuation of previous methods of investigation, with one notable exception. The problems concerned continue to be approached from many sides, with the physiological methods in particular accounting for many reports. The incidence of the schizophrenic reaction, which constitutes the largest single class of admissions to our more than half million mental hospital beds in this country, assures its receiving continuous attention, as does the tremendous economic problem represented by its chronic nature.

Questions of incidence, inheritance, and allied considerations continue to be studied, but no new or striking facts have been presented. Elkind and Taylor, following an excellent study of schizophrenia in New York and Massachusetts, conclude that its incidence per 100,000 population is practically stationary, and that the oft-discussed increase is not a reality. Canavan and Clark have reported intensive studies of children of schizophrenic parents. In their most recent study they report investigation of 117 children. Fifty deviations from normal were found at this time: three were insane, eight were feeble-minded, six backward, and three nervous; 27 showed various conduct disorders, and three, physical diseases. In 47 of these children showing deviations, schizophrenia was present in the mother; in only three had it occurred in the father. The whole question of heredity and its units is still very imperfectly understood.

*Senior Assistant Physician, Delaware State Hospital.

The detailed descriptive matter of the symptoms of schizophrenia, and certain prognostic data, continue to accumulate. Angyal concludes that certain somatic delusions presented may have an actual somatic basis in perception. This is believed to consist of certain muscle sensations. For instance, sensations of heaviness or lightness may be due to involuntary muscle contractions, and coupled with the marked disturbance in self-awareness which may be present, may lead to delusions that the affected part is foreign to the patient's ego, or acted on by outside forces. In this connection, Angyal also reports three instances of hallucinations of small people (Lilliputian hallucinations) in schizophrenic patients. These hallucinations were noted to differ from those found elsewhere in their localization inside the patient's body, and in their hazy character. The belief is advanced that they arise partly from auditory, partly from kinaesthetic sensations; with reduced self-awareness, they appear to be forces within the patient's body but acting in response to outside direction.

An interesting report on prognosis in schizophrenia is that made by Hunt and Appel. Their study is concerned with those cases which lie midway between schizophrenia and the manic-depressive types. These cases are fairly common; their diagnosis is often doubtful because of the mixture of symptoms and prognosis is particularly troublesome. Some such patients recover unexpectedly in a manner similar to the manic types, others go on to definite, chronic schizophrenia and no reliable basis for prognosis has been available. The above investigators studied thirty cases which had been left undiagnosed because of an even mixture of schizophrenic and manic-depressive features. The recovery rate in this series was found to be roughly twice as good as in schizophrenia, but 20-50% poorer than in frank manic-depressive cases. An analysis of various symptoms and their individual relations to prognosis was reported; it is interesting though inconclusive because of the small number of cases reported. It is to be hoped that this definite and little understood group of cases midway between the two psychoses will continue to receive study.

The physical symptomatology accompanying schizophrenic states is still the subject of

constant investigation, and additional facts, which may ultimately be synthesized into a coherent whole, are still being determined. An interesting report by Moore and Lennox is to the effect that the hearts of 284 schizophrenic patients autopsied did not show an average weight significantly less than those of 194 control cases autopsied in general hospitals. The cases were apparently not selected, and the size of the series lends weight to the conclusions obtained. Previous conceptions of the schizophrenic circulatory system may be incorrect. Gottlieb reports a comparison of systolic and diastolic blood pressures in schizophrenia in a controlled series. He studied 26 schizophrenic patients and 16 normal persons, and reports the blood pressure variations both under constant surroundings and under increased temperature of the air. Findings were interpreted as indicative of probable loss of elasticity in the vascular bed of the patients. It was also noted that under increased heat, the heat dissipation was inadequate in the schizophrenic patients; the latter showed about twice as rapid an increase in the oral and rectal temperatures as did the normal controls. This phenomenon was interpreted as showing a static nature of the vascular bed, possibly caused by an unresponsive sympathetic system. Finkelman and Stephens also investigated reaction to cold in fifty hebephrenic schizophrenic patients in a controlled series. Various determinations were used before exposure, during exposure to water at 60 degrees F, and after return to bed after the cold bath. Normally oxygen consumption was increased on exposure to cold; the patients showed an inadequate increase. In consequence of defective heat production, the patients averaged a loss of 0.8 degrees F in body temperature during exposure, though the controls averaged only 0.2 degrees F loss. The reactive hyperemia of the skin which occurs after exposure was also lacking in schizophrenia; the patients showed a drop in heat production immediately after exposure, whereas it normally remains increased for some time. It was incidentally noted that immersion in cold water produced no respiratory shock and little or no shivering in the patients, though the controls showed both. The authors noted the suggestive similarity of these aberrations to those seen in ani-

mals with hypothalamic lesions and therefore suggest a possible physiological disturbance in that region in schizophrenia—a possibility to which attention has been called by other investigators working on apparently unrelated studies. Krinsky and Gottlieb also studied venous blood pressures under various conditions, and noted that the schizophrenic patient shows a much smaller deviation under standard conditions than the normal, and shows a much decreased variation with varied conditions. They offer these findings as further indicating the limited facility of autonomic reactions in the schizophrenic patient. In catatonic patients, Tomescu finds an inhibition, apparently cortical, of stomach contractions. There was a decrease below normal at rest, and a marked decrease instead of the normal increase in the presence of appetizing food. It is suggested that much catatonic negativistic behavior may be on the basis of inhibitory mechanisms causing abnormal states in the organs which would ordinarily be active. The abnormal state of the organ may then influence the ensuing behavior, such as refusal to eat. Lowenbach notes a possibly related finding in catatonic patients. These show a diminished response to stimulation of the vestibular nerve with warm water. Whether the diminished ocular movements are connected with other physical negativistic phenomena, or depend on some specific abnormality (of tension of the extra-ocular muscles, for instance) is in doubt. Sleeper and others investigated the polyuria often seen in schizophrenia, but found it to be dependent on abnormally increased water intake, and of psychic rather than physical interest. In later investigation, the psychic factors were pursued further.

Therapy of schizophrenia remains, of course, of great interest. Fewer reports are seen in connection with various forms of narcosis; the subject has already been exhaustively studied, and where used as an adjuvant to treatment the methods are long since fairly well evaluated, both as to their uses and their very obvious limitations. Favre reports a small series of patients treated with dial, somnifen and cloettan. Results were inconclusive, though a few cases of striking improvements were seen. Monnier has also used cloet-

tan in 127 cases, with improvement in 53, and with two deaths. Becce reports the treatment of 13 schizophrenic patients with gonadal hormones and yohimbine, with apparent recovery in 10 cases. No other reports confirming these findings have been seen.

By far the most interesting experimental development in schizophrenia in the past year, however, has been the therapeutic production of insulin shock. For several years there had been some reason to suppose that carbohydrate metabolism was altered in these disorders. Insulin had also been used but in small amounts and chiefly with the idea of stimulating appetite. Occasionally some mental improvement had been noted in connection with its use for this purpose. In a recent publication, Bennett and Semrad give a bibliography of earlier work with insulin, and report its use in 25 undernourished mental patients. With all other factors apparently equal, they report that the patients receiving 5-15 units of insulin three times a day averaged an excess weight gain of 0.423 pounds per week over those not receiving it. These investigators note, as others had done, that coincident but not predictable mental improvement occurred in some cases. They make no attempt to separate the therapeutic effect of the insulin alone from that of associated factors. The series of 25 patients studied by them includes only two cases of schizophrenia.

The production of actual hypoglycemic shock as a therapeutic measure, however, was introduced by Dr. Manfred Sakal at Professor Potzl's clinic in Vienna in October, 1933. Three years previously he had noted the usefulness of insulin in alleviating abstinence symptoms in morphine addiction. Theoretical speculations as to its mode of action led him to use insulin therapeutically, to the point of producing shock, in schizophrenia. As his reports on its use continued to accumulate, interest in the subject became world-wide. Glueck in a recent report gives an account of a three weeks' visit in Vienna, during which he saw twenty patients under treatment, and examined and read the case reports of many already treated. He gives the average duration of treatment in a group of recovered patients as 52+ days. He gives the statistics of Dussik and Sakal on their earlier group of

patients: these cases number 104. Of the 58 patients who had been ill less than six months, 70.7% apparently showed complete recovery, and 88% improved sufficiently to resume their previous occupations. There were nine relapses; five of these patients were given a second series of treatments, with three second remissions. Of the 46 patients ill more than 6 months, a degree of social recovery was obtained in 47.8% and an apparently complete remission in 19.6%. There were six recurrences, all of which were treated again, with 2 second remissions of fair degree. Glueck also cites a report of Swiss workers which indicates recovery in 48% of 75 cases treated, and in 76% of those ill under six months. It is noteworthy in this report that only one recovery occurred in a patient who had been ill for more than 1½ years, and that 18 of the whole group of 75 patients showed no improvement. Glueck believes that the recovery rate with this form of treatment is definitely greater than the average remission rate in schizophrenia, though he admits the need for unselected patients, controls, and a longer interval of time to determine the duration of improvement obtained. He notes, as other writers are doing, that paranoid types seem to respond better than others. He also calls attention to the dangers of the treatment (he cites three deaths in Vienna, one in Switzerland) but believes it to be somewhat less than the dangers connected with some forms of narcosis or with therapeutic malaria. Finally he emphasizes the total unpredictability of the patients' reactions and the need for excellent organization and individualized care in attempting the procedure.

Wortis also reports his observation of the treatment of 25 patients over a period of about two months. He states in detail the method as it was being carried out by Sakal and others:

PHASE I—PREPARATORY. Gradually increasing doses of 15-40 units of insulin intramuscularly daily, at least two hours after a meal and with no food for four hours afterward. The dosage is increased by five or ten units each day for three to ten days and this leads into the second phase.

PHASE II—SHOCK. Production of (usually) one severe hypoglycemic shock a day,

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EDITORIAL

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W. EDWIN BIRD, M. D. _____ EDITOR
Du Pont Building, Wilmington, Del.

WILLIAM H. SPEER, M. D. _____ Associate Editor
917 Washington St., Wilmington, Del.

M. A. TARUMIANZ, M. D. _____ Associate Editor & Bus. Mgr.
Du Pont Building, Wilmington, Del.
Telephone, Wilmington, 4368

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This year the National Committee of Mental Hygiene chose Wilmington in which to hold its first Conference on education and mental health. This Conference will be held in three other cities in the United States. Wilmington was chosen because the state of Delaware is an ideal one for the study of preventive psychiatry and other factors that are related to mental health. Small in area as well as popula-

tion, it is possible for every individual to be contacted and for one group to have a full understanding of all situations. It affects all types of endeavor, industrial as well as agricultural, and all types of individual economic levels. It presents as complete a picture of life in this country, under favorable conditions, for study as exists anywhere in the United States. It is a state which is alert to possibilities and one which is striving to produce as near ideal situations as it is possible to obtain. The National Committee is interested in Delaware and feels that it can become a leader in work connected with preventive psychiatry. It feels that the coordination between the agencies is good, and that all are working hand in hand to improve adverse conditions where such exist. It is to be hoped that this organization will not be disappointed in the work which the state accomplishes. Each physician, school teacher and welfare worker should strive to carry on their work with the constant thought of future and permanent good. Close cooperation between the three will not only lead to individual improvement in cases suffering from maladjustment but will also lead to the accumulation of much material regarding the etiological factors involved. Technique can be instituted and the results carefully studied, so that information which comes from this state will be the source for programs that can be developed elsewhere. It is hoped that the citizens of Delaware will realize the opportunity which is being given them and attempt to lead in preventive psychiatry and in the treatment of maladjusted individuals.

Research in Schizophrenia During 1936

(Continued from Page 78)

by administration of 50-150 units of insulin. After usually not more than six hours, the shock is terminated by feeding sugar, usually by mouth; the usual duration of this phase is several weeks.

PHASE III—REST. Omission of the shocks one or more days a week during the above period, depending on the patient's condition.

PHASE IV—POLARIZATION. Large doses of insulin, just insufficient to produce shock, are given three times daily and gradually diminished, for a period of one to two weeks.

Wortis also calls attention to the dangers and safeguards which have been determined in some detail. His attitude toward the treatment is favorable, though he recognizes the indefiniteness of the statistics available at this time. He believes the effect of the treatment on the nervous system is obtained by its stimulation of carbohydrate metabolism. He mentions, however, that "The peculiar susceptibility of patients to psychic influences in the later stages of treatment, and the psychic effects of shock and coma may themselves prove to be considerable factors in the treatment."

Margaret Wilson gives an interesting summary of the use of this treatment by various investigators including Sakal in more than 250 cases. Most of the reports are less exact than those of Sakal, but indicate a favorable response, much more marked in recent cases than in more chronic ones. One outstanding exception is the work of Lichter, whose results in nine cases are listed as "all negative." This striking disagreement with the findings of others might be due to one of several causes, but certainly cannot be disregarded as meaningless.

As investigation of hypoglycemic shock spread throughout Europe, it inevitably became a subject of great interest throughout the United States in a very short time. At the present time well organized studies are being carried on in a considerable number of American institutions, and another year will probably provide a large enough volume of statistics and a lapse of time sufficient to make possible a fair estimate of the value of the treatment. The literature of schizophrenia since 1900 records the rise and fall of many new

forms of therapy, and over-enthusiastic first reports have not been lacking. The available data of hypoglycemic shock are certainly not sufficient at this time to establish whether this is another short-lived hope, or whether it may mark a significant advance in therapy, comparable perhaps to the malaria treatment of paresis. It should serve at least as a powerful stimulus to various avenues of research concerning schizophrenia. In view of the unpredictability of individual schizophrenic patients, the few and poorly controlled series reported to date, and the frequently seen improvement resulting from any physical illness, the evidence may be considered as not yet sufficient to warrant any conclusion.

GENERAL PARESIS: EXPERIENCES WITH DIATHERMY TREATMENT

G. JACOBY GORDON, M. D.*

Farnhurst, Del.

In an article published in May, 1935, on the electropyraxia treatment of general paresis, we gave expression to the hope of finding in this newly developed therapeutic procedure a method, though not fully equivalent to, yet decidedly less hazardous than malaria therapy. At that time we presented a description of the routine application of the treatment we adhered to in our hospital. We have had the opportunity of gathering experiences from our own material and no less from various other sources, particularly from the accumulating reports of other workers.

To be sincere we must first mention certain obvious failures brought about by deficiency of the mechanical devices. The electric coil which we formerly placed on the chest of the patient showed definite disadvantages. It was relatively heavy and caused much discomfort to sensitive patients. It concentrated the current on a limited area of the body surface, thus giving rise to burns in a few instances. Our first task was to overcome this defect.

The coil, wound about three turns, developed defects of insulation; and the substitution of this important part of the machinery created an undesirable interruption of treatment courses.

To make this coil work in a safer and more suitable manner, it was designed by the manu-

*Assistant Physician, Delaware State Hospital.

facturers in a hard rubber box, supported on a special upright standard, so constructed that the coil might be placed wherever the operator wished with reference to the patient's body, without actually touching it. However, even this device did not exclude the danger of burns during a prolonged therapeutic session, but it remained useful for shorter local therapy.

The next advance was made by submerging the cable in a thick layer of padding on which the patient lay. Instead of the rubber blankets which were formerly held in place by firmly tied straps, a special bag of insulating material, with zippers, was introduced and much favored by our patients. And now, lying in this bag, they could turn from side to side and take any preferred posture without diminishing the therapeutic effect to any noticeable extent.

With greater comfort resulting, the duration of the therapeutically active degrees of the artificially produced fever could be profitably prolonged.

The preparation of the patient for the hyperpyrexia treatment has remained practically the same in type. We secure a thorough elimination prior to the treatment in the interest of an uninterrupted course of the hyperpyrexia sessions.

In regard to the patient's diet on the day of treatment, we have become somewhat more liberal, allowing easily digestible carbohydrates in order to prevent the exhaustion of the physiological carbohydrate reserves and the occurrence of disturbances arising from hypoglycemia.

The success of the fever therapy largely depends on physical factors. The analysis of the fever curves obtained from our patients suggests that a normally balanced vasomotor system is the best guarantee for an uneventful treatment.

Sudden jumping of the pulse rate, falling of the blood pressure, circumoral pallor, restlessness combined with apathy, cyanosis, suggest impending vasomotor collapse.

Other dangerous situations arise whenever the respiratory rate is seriously troubled either in the direction of a hyperpnoea or, in form of a distinct gradual decrease of the respiratory rate, which is more grave.

Irregular and fluctuating curves of respiration or pulse are always warning signals, deserve serious consideration and should cause the operator to consider the wisdom of continuing that particular treatment. Disturbances of this type are liable to occur particularly during the peak of the temperature and during the phase of the dropping temperature after the patient has been taken out of the bag. In a few instances we have found an unusually scanty perspiration, and these cases have turned out to be poorly adaptable and little responsive to any regular continuation of the fever therapy course.

Occasionally we have met unexpected rises of temperature, leading to an increase of from 2 to 3 degrees within ten or fifteen minutes. Such accidents may become difficult to cope with and require immediate breaking of the current. They are best prevented by a continued check-up on the temperature. We feel that to the rectal thermometry devices rightfully goes the claim of superiority in regard to the steady temperature control though we have no personal experience with any of their type.

The optimal respiratory and pulse curves are those which remain at an approximately even level throughout the treatment. The longer effective temperature levels can be maintained without vasomotor or respiratory disturbances, the more successful the hyperpyrexia treatment promises to be.

One of the most feared events during fever therapy is the occurrence of convulsions, and it is most disastrous if an epileptic attack is followed by a series of epileptic seizures or by an epileptic status. We had to discontinue the treatment of a woman, who presented an epileptic seizure with temporary loss of speech during fever therapy. In many patients we have noticed muscular twitchings of the facial muscles and on the extremities during the peak of the temperature curve. These twitchings are less alarming and should not be confounded with epileptic seizures.

The integrity of the autonomic function seems to us the most important requirement in the application of the electropyrexia. Mental factors play a lesser though none the less considerable role in the course of fever treatment. We found that demented patients generally

are much less inclined to stand the discomfort of fever therapy. They become much more unruly and uncooperative than the average patient presenting a well preserved personality and a short disease history, however, there are exceptions. Certain cases with hypochondriasis and fear reactions may offer insurmountable obstacles to the application of fever therapy, and require a special psycho-therapeutic preparation. They commonly pretend to suffer unbearable pains or to be burned and beg for immediate termination of the treatment.

Generally we can observe two phases of the fever treatment. During the temperature rise, we often find a state of mental stimulation with overtalkativeness and restlessness. During this phase, patients are prone to exteriorizing trends which were not perceptible before. In this phase latent depressive or expansive or paranoid tendencies may crop out. Many patients become noisy, start to sing or to pray, become flighty or incoherent. We noticed a delirious reaction in only one instance. This patient did not exhibit delirious symptoms before the onset of the fever treatment. The second phase is marked by exhaustion with a tendency to drowsiness and calmness.

A decrease of physical reserve power is eas-

ily detected from one session to the other by gradual diminishing of blood pressure, increase of pulse rate, and eventually symptoms of beginning cardiac decompensation.

II

The following table includes a group of eleven patients whose fever treatment was considered as complete. These patients received each 7 or more treatments with satisfactory results, i. e., they were able to stand the applied treatment without any serious difficulty. This group of patients with general paresis was chosen for a survey because the termination of their treatment is remote enough to allow a fair estimate of their clinical development.

Without intending to draw too far reaching conclusions on the basis of such a small group, we feel at least the need for an explanation of certain prominent features of the inductotherm therapy.

In spite of the fact that this group underwent a satisfactory treatment course, these patients have shown clinical improvement only in three cases presenting a history of symptoms of not more than a year's duration.

Those patients who have carried the disease for years and are already more or less deteriorated—despite malaria therapy—appar-

Case	Sex	Age	Duration of Symptoms	Other Treatment Before	Fever Treatment Number of Sessions	Other Treatment After	Spinal Fluid (a) before (b) after	Clinical Status
I	M	60	4 yrs.	Malaria (7 chills)	15	—	(a) Negative (b) Not repeated	Unchanged
II	M	28	2 yr. 4 mo.	Tryparsamide (15 inject.)	15	Tryparsamide	(a) Wa. 444— c. g. 4555553100 (b) Wa. 4442— c. g. 2342210000	Unimproved
III	M	27	1 yr. 1 mo.	Tryparsamide (15 inject.)	11	—	(a) Wa. 4441— c. g. 5555554310 (b) Wa. 4444 c. g. 45555532100	Died-March, '37
IV	M	35	4 yrs.	Malaria (12 chills)	10	Tryparsamide	(a) Wa. + + c. g. 1354443100 (b) Wa. + + + + c. g. 45555543310	Stationary
V	M	34	1 yr.	Tryparsamide (11 inject.)	11	—	(a) Wa. 4444 c. g. 4555555420 (b) Wa. 44441 c. g. 1223454221	Paroled, Impr.
VI	M	40	1 yr. 11 mo.	Malaria (7 chills)	7	Tryparsamide	(a) Wa. 4444— c. g. 3355555320 (b) Wa. 4444— c. g. 4455542100	Stationary
VII	M	31	8 mos.	—	7	Tryparsamide	(a) Wa. 4444 c. g. 4555554311 (b) Wa. 44— c. g. 0223300000	No Mental Improvement
VIII	M	28	9 mos.	Tryparsamide (15 inject.)	7	—	(a) Wa. 4444 c. g. 4322100000 (b) Wa. 44— c. g. 5444311000	Not improved
IX	M	40	3 yr. 5 mo.	Tryparsamide (6 inject.)	8	Tryparsamide (7 inject.)	(a) Wa. 4444— c. g. 0000000000 (b) Not repeated	Deteriorated
X	F	36	3 mos.	—	14	Tryparsamide (3 courses)	(a) Wa. 44300 c. g. 4555555300 (b) Wa. 44440 c. g. 2345543000	Improving Tardily
XI	F	58	4 mos.	—	11	Tryparsamide (along with hyperp.)	(a) Wa. 44443 c. g. 455555532 (b) Wa. 4444 c. g. 3344431000	Improved

ently show little if any benefit from the inductotherm treatment beyond, possibly, the retardation of the disease process.

The results of the spinal fluid tests are not likely to give us very reliable prognostic data. In a number of cases, we observed a tendency to a gradual lowering of the colloidal gold curve and even a quantitative reduction of the spinal fluid Wassermann, yet the results of these tests do not appear conclusive if considered independently of the clinical findings.

We like to combine the inductotherm treatments with injections of tryparsamide known as a therapeutic agent of considerable value. For this reason alone it is somewhat difficult to exactly determine the immediate effects of the artificially produced fever. It is generally believed that the diathermy treatment exerts an activating power on the chemical reactions as well as on the tissue metabolism, thus producing a therapeutic synergy.

The inductotherm treatments are, of course, not a substitute for, but are to be used in conjunction with the accepted tryparsamide therapy.

DEMENTIA PRAECOX— FAMILY TENDENCY

M. ZIMBLER, M. D.*

Farnhurst, Del.

Many psychiatrists view Dementia Praecox as a reaction type of maladjustment, a result of repeated failures of the individual to adapt to his environment. In short, Dementia Praecox is considered to be caused by exogenic factors, conflicts, disappointments, traumas, etc. Other investigators stress the hereditary and constitutional makeup of the patient as being more important. By statistical evidence it has been found that inheritance is an important factor to be considered in the etiology of schizophrenia. It is proven that among the schizophrenics' antecedents there are three times as many psychotics as among those not schizoid. Schizophrenia has its heaviest tainting in those who are in indirect relationship to the patient. The factor which is transmitted seems to be of a complex recessive type rather than of simple Mendelian character.

For illustration we have chosen two families wherein several members are afflicted with dementia praecox. These patients are still con-

fined to the Delaware State Hospital. One family is Jewish and the other is Negro.

In the first family both parents are Jewish and immigrated to the United States as young people. The father was a Rabbi for forty-six years in Wilmington, was preoccupied with scholastic studies, and neglected his family life. The mother was queer and apparently psychotic. The oldest son, a patient with dementia praecox, was admitted to Perryville Hospital. One sister, F. R., died in the Delaware State Hospital in 1927. Her diagnosis was Manic Depressive Psychosis. She was admitted in 1926, suffering from irritability, incoherence and delusions. Previous to admission she had conflicts due to an unhappy love affair, also to pregnancy and abortion. She had been discharged, but later readmitted.

The second member, D. R., was committed in August, 1931. She had completed three years of high school and thereafter worked in a shop in Philadelphia. For three years previous to commitment she worked as a domestic. She was a good mixer and reacted normally to people. The onset of the disease appeared when patient became obese. At that time she had a "nervous breakdown." She was confined to bed, was passive and untidy. She recovered at that time, but a year and a half before commitment she had a second attack. She appeared at times restless, most of the time apathetic and expressed unsystematized delusions, for instance, that she had a cat in her stomach. She underwent a tonsillectomy at the Delaware Hospital. Previous to commitment to the hospital the patient associated with a woman who showed psychotic symptoms. The patient was impressed by the attempt of the woman to commit suicide by taking poison. Many other factors precipitated this attack. The house was in a turmoil because of a fire. Patient secretly called on a doctor asking for advice because she did not feel well, but soon she started to display mental symptoms. She was taken to a boarding house where she became more agitated and in twenty-four hours had to return home and her condition became worse. She was violent and used obscene language. She went into a neighbors' house, turned on the radio and started to dance. Because of her erratic behavior it was decided to commit her to the

*Junior Assistant Physician, Delaware State Hospital.

hospital. Before she was committed she ran out of the house naked and was picked up by the police. After commitment, she was very antagonistic. She showed some mannerisms and was irrelevant in her responses. Physically, she was negative except that she was extremely obese, had a foul odor to the breath, and urine showed some traces of albumin. X-ray showed the presence of some teeth roots. Mentally, since admission, the patient has remained disturbed and has required cold pack treatments. At intervals, she has become noisy, has used quite profane language, and would expose herself. On interview she remained irrelevant and when conversing often answered her own questions. In November, 1931, patient showed considerable improvement. At that time she was coherent and relevant, had no delusions or hallucinations. However, in March, she was again restless, seclusive and rarely spoke to anyone. She remained in this condition, doing only a little work and that of a very simple type, until September 1, when she became tidy, showed some interest in her appearance and she was more active. She smiled when spoken to and shook hands spontaneously, and ate without being fed. In October, she had a catatonic attack, but showed improvement. In April, 1933, she again became overtalkative, very silly and irrelevant. She remained much the same until August when she became assaultive and had to be secluded. She attacked her brother because he refused to take her home. She also attacked the attendant. A year later, in August, 1934, she showed a tendency to meddle, and almost set fire to the building when playing with the radio. In December of the same year, another patient was moved into the room with her. The patient liked to sleep with the door closed. Patient grew quite violent about this and caused a disturbance on the ward. She continued destructive and assaultive until October, 1935, when she became quiet and well behaved. At that time she showed no desire to leave the hospital. This state lasted until December, 1936, when patient was transferred to another ward because of her behavior. She is at the present time secluded half the time because she is irritable and fights with other patients. She is obscene, untidy and combative.

The third member committed was A. R., who was admitted in January, 1932, at the age of thirty-nine. She was single and a stenographer. She was quite intelligent. She had held several different jobs as a stenographer, working in real estate and law offices. When she changed positions she claimed it was to improve her position. She was quick tempered but kind to the family, very ambitious and wanted to be a success and to have her family successful. She did not associate much with other people and had few friends, and never cared for the opposite sex. About a year and a half previous to commitment a change in patient's disposition was noticed. She became contrary and worried because her family was not successful. She also worried over the sudden death of her father, and because her sister was committed to the Delaware State Hospital. She was concerned about her condition and visited several doctors. She imagined that the doctors were responsible for her condition. She became very irritable and wandered about the streets. She called many doctors on the phone and was quite troublesome. She claimed that someone was trying to steal from her and annoyed the police with her constant complaints. She clearly showed that there was something wrong mentally. Physically she was well developed and fairly well nourished. Heart and lungs were negative. Blood pressure 138/80. Neurological examination and all laboratory work were negative. Patient was resistive, assaultive and troublesome after admission. She would remain quiet when left alone, but became irritable when questioned and immediately began expressing her paranoid delusions. She said that her being sent here was irregular, and that the place and doctors should be done away with, asking why her family should be treated in this way. Patient was well oriented for all spheres, showed fair memory for recent and remote events, but judgment and reasoning were weak. Insight was entirely lacking. When she was first admitted she seemed very confused and could not understand why she was brought here. She exhibited auditory hallucinations. She remained noisy, restless, overactive, and paranoid. She had to be secluded because of her tendency to try to get out. She became a little more pleasant for a

short time and then again became noisy and accusatory. In October she again showed some improvement and was transferred to a quieter ward. Here she wrote letters asking to be sent home, but made no attempt to get out. Patient seemed to continue to improve and was paroled in November 1932. Patient was returned from parole on March 14, because she became worse. She showed the same behavior pattern as she had before, had practically the same delusions and hallucinations, the delusions being of a sexual character, and talked at length, but paid little attention to what was said to her. She resisted having tests made. In July she was a little more agitated and insisted upon going home. She was inactive and slept a great deal except when temporarily agitated. In September patient was again quite disturbed and irritable. Since then she has been careless, apathetic, and staying in bed much of the time.

The last member of this family to be admitted was H. R., who came to the Observation Clinic in April, 1933. His diagnosis was schizophrenic personality. He was committed to the hospital proper in 1935. He was graduated from high school at 18, was active in athletics, had many friends, but was never aggressive and took a normal interest in the opposite sex. After graduation he worked as a clerk. He was an abstainer. In 1931 he secured steady work and spent most of his time at home. He did not get along with his sister and suffered a great deal because he realized that his mother and sister were abnormal. He tried to protect them. He always seemed to be disgusted about their talk of the neighbors persecuting them. Before his commitment to Observation Clinic, he went to a drug store and asked for poison, saying that he wished to commit suicide. He became incoherent. After he was discharged from the Clinic, he did not seem to adjust and became childish and restless. Two months previous to commitment he became overexcited and disturbed, having frequent attacks of shrieking and yelling. About 5 weeks before admission, patient left his home and went to New York. He was followed by his brother who finally found him after visiting several dance halls. They remained for a week and patient appeared normal. He returned home willingly. On the day before

his commitment patient left home early in the morning and went to his bank. His brother followed him, which made him angry. He was arrested for his queer behavior and committed. Physically he had psoriasis over the body. Tonsils were imbedded and a number of the teeth were extracted. Heart, chest, abdomen, and G. U. organs were negative. His blood pressure was 124/90. Deep tendon reflexes and abdominal reflexes were diminished. All laboratory work negative. His diseased tonsils were later removed. Mentally, patient was very silly, talkative, and restless. He expressed many peculiar ideas and declared that he wanted to go to Africa and found a kingdom of his own. He frequently required sedatives. He was emotionally shallow and judgment and reasoning were poor. His behavior was very erratic and irritable. On several occasions he attacked his brother when he came to visit him. No change has been noticed in patient's condition since. He exhibits many bizarre ideas and he constantly talks of sex and women.

As we see the father was somewhat impractically inclined and the mother was definitely erratic, maybe psychotic. Five siblings are psychotic and four of them have been diagnosed as Dementia Praecox, Paranoid Type. The onset of the disease started in the prime of life just as it was necessary for them to become independent and leave their home to struggle for their own living.

Family 2—The second family is a colored family. The father died in 1928 from Bright's disease. He was erratic and had a violent temper. He was very peculiar and pessimistic about everything. The mother is still living, suffering from attacks of rheumatic fever. One paternal aunt was a patient at the Delaware State Hospital in 1926 and died in 1927. The diagnosis was Acute Melancholia. Three members of the family are at the present time in the Delaware State Hospital.

The first one committed to the hospital was S. M., who was admitted in March 1926, being brought from the New Castle County Workhouse. Patient was discharged in 1927. He was recommitted in August 1936, being again brought from the Workhouse where he had served many sentences on many different charges. He did not go far in school and was

the only member of his family that did not complete high school. He frequently ran away from home, never worked steadily, and could not hold a job for any length of time. He was rather shiftless and let his brothers and sisters support him as long as they would. He drank excessively after he grew up. He never mingled with the opposite sex. Patient was 37 years of age, in fair nutrition with a scoliosis and facial asymmetry. He had many scars over his extremities and body. He was edentulous and tonsils were removed. Heart—second pulmonic sound accentuated. Blood pressure 120/80. Lungs negative. Patient had an umbilical hernia. Nervous system was negative. All laboratory work was negative. The x-ray was negative except for pieces of roots of teeth. Patient showed asocial tendencies, made fairly sensible answers, but it was difficult at times to follow his statements. He gave some record of his past life and claimed he worked at jobs. Said that he drank excessively, but stopped drinking about 3 or 4 years ago. He admitted that he had tried to injure a man with a razor blade just about 3 weeks before commitment. Patient seemed to brood all the time. He expressed delusions of a bizarre character. He used words in very strange ways, such as that literary was the first stage of insanity, saying that Farnhurst is a place for literary people, that means those who do not have the proper mind. His delusions are not systematized. He misidentifies people. States frequently that the physician visited him in prison. He became accusatory and assaultive at times. He has to be kept in seclusion and sedatives given. From time to time he becomes more amiable and helps with the ward work, but apparently due to auditory hallucinations, he becomes disturbed and has to be secluded again. Memory is satisfactory for recent and past events.

The second member of the family, F. H., was admitted in February 1927, at the age of 26. Patient had a good education, having finished normal school. At the age of 23, she married, living for about six months in Philadelphia. She had one child. Her husband left her when the child was a year old. According to the social history, she worried a great deal because her husband did not support her and she went back home to her

mother. About three months previous to commitment her mental condition became worse. Some peculiarities in her behavior were observed by her mother and sister for quite a while. Patient worked as a domestic until 2 weeks before commitment when she became very excitable, showed some evidence of having hallucinations and talked of snakes being in her room and of people trying to kill her. While she served at the table, she thought that people looked at her in a strange way and were going to kill her. She kept her shades drawn and the shutters closed. The day before admission she overturned a lamp and nearly set fire to the house. At the age of 18 patient had had rheumatic fever. After admission patient did not cooperate much of the time. She was at times very violent, though this was always a defensive reaction. She was very resistive. She *refused* for a long time to wear shoes and stockings. Mentally she was negativistic, refusing to talk much of the time and content of thought was irrelevant. She had all kinds of hallucinations, frequently screaming at night time. At times her fright is so great that she trembles. Physical examination on admission was essentially negative. After commitment patient showed some evidence of being very silly, sang and danced about the ward. In September 1928 she did not show so many delusions. In March 1929, she still told fantastic stories and was quite hallucinated, disturbed, assaultive, oriented, but had no insight. In November 1931 she was still combative and noisy, idle most of the time. Coherent and relevant. Oriented. In 1936, about the middle of the year, she was working but was still combative. Later she was destructive, but quieted down, though hypochondriac complaints were present. Examination showed nothing wrong.

The third member was admitted in March 1935. She is very intelligent, a teacher in a colored school in Wilmington. Previous to admission she had marital difficulties. She attended high school and was a good student. She was married to a mail carrier who secured a divorce from her a few years before admission. He claimed that patient showed some peculiar behavior for a few years. She became very extravagant and made debts beyond her capacity to pay. She frequently made re-

marks about people watching them on the street. She annoyed the postmaster with frequent complaints of her husband being unfaithful and he finally secured a divorce. She lived after that with a man infected with a venereal disease. In October 1934 patient began to express ideas that someone followed her. She acted so peculiarly and became so irritable and noisy that she was discharged from her position. Physical examination showed a female 40 years of age, well nourished with well developed skin fat and musculature, with myoma of the uterus. Central nervous system was essentially negative. Mentally; patient stated correctly her education. She said her marriage was unhappy because of the interference of her mother-in-law and her lack of faith in her husband. She was in an accident in 1931 and was unconscious at this time. She suffered a lesion of the leg and an operation of the right shoulder was necessary. Patient was tidy, cooperative, composed, but at times somewhat irritable and excited. She was oriented in all spheres. Her memory was intact for both recent and past events. Since admission patient on different occasions accused other patients of annoying her and persecuting her. She gave some evidence of having auditory hallucinations. Recently patient continues irritable and destructive to furniture, paranoid and threatening, requiring strong sedation. Continues her complaints of sexual abuse by other patients. Patient is accessible, though antagonistic at times toward physician and nurses. This patient was diagnosed as Paranoid condition.

In this family we see that the father showed some hereditary taint. One brother was alcoholic, while three siblings were definitely psychotic. One of the brothers show asocial tendencies, and marked peculiarities since childhood. It is a question whether it was a psychopathic or a prepsychotic state. Later on it turned out that he was a typical Dementia Praecox, Paranoid type with criminal tendencies. For some reason, though his diagnosis was Dementia Praecox he remained outside and continued to be dangerous to society until he was recommitted to a mental hospital. His sisters though intelligent and ambitious broke down apparently under marital difficulties. One was diagnosed as Dementia Praecox and the other as Paranoid condition.

All our described cases undoubtedly had a tainted antecedent, some direct and others indirect, but at the same time they have lived under very unfavorable circumstances. Although they attended American schools the home environment had a bad influence in childhood. To our regret we could not obtain a definite and clear picture about the childhood of all these patients. Nobody can deny that the first experiences in childhood, the way of living, traditions, customs, social standard, cultural atmosphere are apt to influence children in a formative manner and create behavior patterns; if the domestic conditions are unhealthy and some family members are mentally unbalanced, unusual changes may be precipitated and disturb the normally integrated individual especially when they are constitutionally predisposed to a mental illness. Later in life one continues to use the same mechanism and pattern of reactions to difficulties. One may ask what would happen to the patients if they were placed in a normal environment. No definite conclusion can be drawn because Dementia Praecox is a disease which even occurs among primitive tribes. One is not justified to conclude that the traumas which our patients experienced undoubtedly are the factors of causation as they may be also the symptoms of the onset of disease.

In spite of the modern trend to find etiologic factors for Dementia Praecox either in the psychological makeup or in somatic functions of the individual the hereditary factor cannot be entirely disregarded, particularly in patients with obvious familial involvement.

PSYCHOMETRIC PATTERNS OF STATE HOSPITAL PATIENTS

JOSEPH JASTAK, Ph. D.*

Farnhurst, Del.

Intelligence is one of the determinants of human adjustments. It is usually defined as the ability to learn, or the ability to adjust to new situations, or the ability of good responses from the point of view of fact. According to these definitions behavior as a whole is nothing but intelligence. Since such an assumption is obviously absurd, the definitions are also absurd. From the clinical point of view they

*Psychologist, Mental Hygiene Clinic and Delaware State Hospital.

are absolutely untenable. Lack of intelligence is the least important and the least frequent factor causing social and individual maladjustments. Inability to learn, to adjust, to see the facts, and, along with it, many a low intelligence quotient is much more frequently determined by non-intellectual factors than by lack of native endowment. The so-called intelligence quotient is never just an *intelligence* quotient. The inadequacy of current conceptions of intelligence or intellect is best illustrated by the fact that the above definitions apply equally well to any attribute of behavior which is known to have nothing in common with intellect. Thus sanity, in its psychological implications, may also be defined as the ability to learn, or the ability to adjust to new situations, or the ability of good responses from the point of view of fact. Although, superficially, it would be difficult to find better definitions of sanity than those just mentioned, they are as unscientific and illogical in their application to sanity as they are to intelligence.

Do psychometric tests measure sanity? Indeed, they do. Do they measure just sanity and intellect? No, they measure all of behavior, innate and acquired. Each test measures all behavioral dimensions at the same time, but in different proportions. The true dimensions of behavior are as yet unknown. Experienced psycho-clinicians who have a good intuitive grasp of the meaning of test results may also have a vague understanding of the general attributes entering into test situations. An empirical objectification of this differential sense of values remains to be accomplished. The prophecy may be ventured that the next major contribution to psychometry and psychiatry will emanate not from statistical factor analyses and similar academic necropsies, but from clinical studies of human material which is very much alive.

The simultaneous sensitivity of the mental test to all behavioral dimensions has been its outstanding weakness in the past; it will become its great strength in the future. Failures due to lack of balance or relevance of behavior are qualitatively different from failures due to lack of intellect. In this lies the clue to the simultaneous measurement of both, and of much more. A pattern analysis of the

results obtained from a scale similar to the present Stanford-Binet Test will yield a fairly accurate picture of several fundamental variables, uncorrelated yet inextricably woven into the unified Gestalt known as personality or individual behavior. Any psychometric ability is the function of all that is essential in behavior. If intellect is an essential attribute of man, then each test measures intellect. If sanity, will power, temperament, laterality, character, cultural background, and educational opportunity are other such factors, then they too are measured by each test at the same time. The true difficulty of an item, the zero point of difficulty, and equal degrees of difficulty will remain mysteries as long as we fail to recognize that difficulty of a task never depends on intellect alone. If intellect is one dimension of behavior, then all attempts to discover the attributes of intellect resemble the arduous but futile task of trying to find the dimensions of a dimension, e. g. the length of length. If an accurate and precise formulation of hypotheses precedes an experiment, a relatively brief test scale applied to 50 individuals will shed more light on the organization of the human mind than 45 long test batteries administered to 50,000 cases and treated by mile-long statistical formulae.

No one test scale may be expected to give a valid index of intellect under all circumstances. Frequently the Terman Vocabulary test yields the best single measure of intellect, at times the Stanford-Binet Scale does, and many times any of the well-known performance tests gives the most satisfactory rating of intellect. Occasionally, an achievement test in arithmetic reflects the true level of intellect, and sometimes a reading comprehension test does this better than any of the standard intelligence scales. Occasions arise not infrequently when none of these tests will suffice. In such cases, the intra-test variability must be resorted to for a correct diagnosis of intellectual level.

In a clinical setting where cases of school retardation and delinquency constitute the major case load, the performance type of test yields the most accurate and valid rating of intellect. In such groups 60 to 70 per cent of all diagnoses of intelligence are incorrect if based on the Stanford-Binet test alone. The

apparent intellectual inferiority of delinquents is usually a non-intellectual inferiority. An unselected group of delinquents is of average or near average intelligence notwithstanding the thousands of Stanford-Binet quotients which show averages between 70 and 80. The wholesale misinterpretation of the intelligence of delinquents equals in its graveness another famous, but spurious observation that school achievement is chiefly determined by the level of intelligence.

In a State Hospital setting, 90 per cent of all diagnoses of intellect are incorrect if based on a performance quotient alone, and 60 per cent are incorrect if based on the Stanford-Binet test alone. In the majority of cases suffering from mental disorders the Terman Vocabulary test, one of the most reliable tests so far standardized, gives the most accurate picture of native intelligence. The vocabulary test measures the level of ideational abstractions; the Stanford-Binet scale includes tests of memory, reasoning, social and practical comprehension and judgment, involving a predominantly verbal expression; the performance battery comprises manual tasks depending on memory, concrete reasoning and planning, goal retention, and psycho-motor efficiency. The pattern of the psychotic is essentially this: Vocabulary highest, Stanford-Binet next, manual performance lowest. Let us illustrate with actual cases:

Psychiatric Diagnosis	Sex	Age	School Grades	Voca- bulary Quotient	Stanford Quotient	Perfor- mance Quotient
Manic-Depressive	F	33	12	120	80	73
Manic-Depressive	M	47	7	92	72	52
Dementia Praecox	M	22	10	104	82	67
Paresis	M	41	12	100	79	68
Alcoholic Psychosis	M	46	8	112	104	85
Anxiety Neurosis	M	24	12	128	122	82
Senile Psychosis	M	68	4	82	64	52

In these cases, what shall our diagnosis of intelligence be? If we are accustomed to thinking in terms of abilities and factors we may dismiss the widely divergent scores by the unimaginative argument that these individuals possess high verbal and low manual abilities. Psychometrists would say that the vocabulary test places these people in the average or superior group, the Stanford test in the dull normal group, and the performance test in the moron group. The tester's magic, however, is not acceptable clinical psychology. Furthermore, the prevalent practice of considering the Stanford-Binet quotient as the most important criterion of intellect is one of

the most insidious errors of judgment which psychiatrists and psychologists continue to make. It hardly takes an expert to say what our diagnosis of intellectual level should be in the above cases. It should be one, not many. It should be based on the vocabulary rating which is least affected by the adjustment difficulties which these patients experience. The vocabulary score represents the true degree of intellect as measured by several other criteria such as cultural background, social standing, school attainment, occupational status, general ideational development, and so forth.

The present paper presents a cursory analysis of the test findings on all patients examined at the Delaware State Hospital between October 1936 and March 1937. During that period exactly 100 patients were given a comprehensive psychological examination including the Stanford-Binet Scale and the Army Individual Performance Scale. (Ship, Profile, Manikin, Knox Cube, Cube Construction, Designs, Mazes, Healy II.) The group includes 34 female and 66 male adult patients. Their ages range from 17 to 77, the average being 39 years. Eighty-six of the patients were diagnosed as psychotic, fourteen were without psychosis. Vocabulary ages were derived from norms published by this writer in a study of behavior disorders in children. The vocabulary test was included in the Stanford-Binet ratings. The average test quotients for the psychotic and the non-psychotic patients were as follows:

	Vocabulary	Stanford	Performance
Psychotic (Number 86) ...	96.5	84.9	73.4
Non-Psychotic (Number 14)	80	77.6	82.1

The discrepancies between the test quotients for the psychotics are all statistically significant, the standard error ratios being 3.45 for the vocabulary and the Stanford tests, 3.65 for the Stanford and the Performance tests, and 7.7 for the vocabulary and the performance tests. The relatively low quotients of the non-psychotic group are due to the fact that it includes five individuals of straightforward intellectual deficiency. The variability of the three test quotients in the non-psychotic group is strikingly small both in the averages for the whole group and in the individual cases. All quotients here presented have a chronological age divisor of 14 years. The 14-year limit yields the fairest and most

representative ratings in comparison with average adult test attainment, although the current psychiatric practice is to use the 16-year limit. The decision of the American Psychological Association favoring the 14-year limit in the calculation of intelligence quotients for adults deserves full consideration. The following table showing the average quotients of four groups of patients with different levels of educational attainment bears further evidence of the greater accuracy of the 14-year divisor.

Grades Completed	Number	Vocabulary	Stanford	Performance
12 and more	20	120.8	112.6	87.8
8 to 11	32	98.6	88.1	74.8
4 to 7	26	88.7	75.8	70.6
0 to 3	22	68.8	58.4	58.0

The 16-year divisor would yield an average vocabulary quotient of 105.7 for the high school graduates, 85.7 for the elementary school graduates, 77.6 for the upper elementary school group, and 55.8 for the primary school group. It is very improbable that the average I. Q. of the elementary school graduate is only 85.7.

The table also reveals that the typical hospital pattern is preserved on all levels of educational achievement. Its tendency to narrow down on the lower I. Q. levels is, of course, partly a statistical phenomenon. The discrepancies are least significant on the lowest I. Q. level, because this group comprises a number of patients with irregular or non-typical patterns and a number of non-psychotic defectives. The vocabulary quotients range from 32 to 150, indicating that insanity occurs at all levels of intellect. The performance type of test, it would seem, is almost valueless for purposes of intellectual diagnosis of individuals displaying unstable and irrelevant behavior. Still it should not be eliminated from clinical use, as the discrepancy its ratings form with either the vocabulary or the Stanford ratings frequently constitutes a fair measure of the degree of dysfunctioning present. The great psychiatric value of objective tests lies not in the absolute quotients they yield, but in the patterns which several quotients form.

The concept of deterioration should be avoided in the psychometric diagnosis, because tests seem to show that neither intellect

nor other behavioral functions actually deteriorate. Babcock's notion of deterioration and dementia is a misinterpretation of experimental findings. If the discrepancies become significantly smaller or if they disappear entirely, as they seem to, when improvement in the patient's mental condition occurs, then obviously the patient's abnormal condition could not have been due to deterioration or loss of intellect previously possessed. The adequate ratings of these patients in the highest intellectual functions afford another evidence against deterioration. While we may be justified in speaking of behavioral dysfunctioning, disintegration, or disorganization, the idea of deterioration should be avoided as an hypothetical and empirically unsubstantiated concept. Even in cases of paresis, toxic and alcoholic psychosis test results become less variable whenever treatment results in improvement or cure. Behavioral dysfunctioning may also be measured with a fair degree of accuracy in children. Their test patterns closely resemble those of the psychotic adult if inherent instability or mental pathology is present, yet it would be incorrect to speak of deterioration or dementia. The psychometric patterns most frequently found in delinquent children are diametrically opposed to those of the psychotic, and therefore evidence a behavioral organization which is entirely different from that of neuropathic, psychopathic, and psychotic individuals. The patterns of delinquents rarely indicates inherent instability.

Twenty-three patients of our psychotic group were either paroled or discharged as improved shortly after the psychological examination was made. The average quotients for this group are: Vocabulary 96.4, Stanford-Binet 93, Performance 85.6. The discrepancies still exist, but they are considerably smaller than those of the psychotic group as a whole. It is likely that the state of dysfunctioning of these patients was much milder and much more benign than that of the unimproved patients—even at the time of their admission to the hospital.

Does the hospital pattern appear in patients with different psychiatric diagnoses? The following table presents the average quotients of several diagnostic groups and their average

educational attainment in terms of school grades completed.

Diagnosis	No. Cases	Vocabulary Quotient	Stanford Quotient	Performance Quotient	School Grade
Psychoneurosis	7	106.4	105	86.3	10
Paresis	7	101.1	80.6	67	9
Manic-Depressive ..	23	100.1	88.6	74.6	8.2
Paranoid Condition	4	99.5	91.5	83.6	9
Alcoholic Psychosis	15	94.5	89.3	78.5	6.8
Dementia Praecox ..	16	89.9	78.7	77.7	7.4
Other Organic Psychoses	14	84	68.8	58.9	5.7
Without Psychosis	14	80	77.6	82.1	5.1

All diagnostic categories show the same psychometric pattern except the non-psychotic group. Some groups show greater variability than others. In those the discrepancy between the Vocabulary and the Stanford Tests is greater than between the Stanford and the Army Performance tests. In others the reverse relationship exists. All these differences reflect mental trends controlled by behavior dimensions other than that of dysfunctioning. Among the 86 psychotic patients 69 per cent show the typical pattern of the averages presented. Another 19 per cent have irregular patterns with disparities of more than 12 points between either the Vocabulary and Stanford, or between the Vocabulary and Performance, or between the Stanford and Performance. The performance quotients are in no case higher than the vocabulary quotients. Only 12 per cent of the cases have insignificant discrepancies between the three ratings. The performance score is in only four cases the highest score. Such patterns tend to occur in patients with low quotients on all three tests, and in patients with a mild degree of dysfunctioning and a latent pattern typifying the non-verbalist group studied in C. Uhler's paper and the delinquent group studied by D. Glanville in this number of the Journal. The behavioral dimension responsible for the verbalist type of adjustment and that favoring a non-verbalist type of response may produce a clash of opposing forces in the same individual. Such cases present the most challenging problems in the clinical diagnosis of intellectual level. Vocabulary responses are inferior because of one extra-intellectual factor, concrete responses are inferior because of another extra-intellectual factor. The third factor—intellect itself—is misrepresented by all quotients. In such cases all ratings may be below 70, and yet the potential level of intellect may be anywhere from dull normal to superior.

It must be born in mind that the test scales here used were not standardized for purposes of multiple diagnosis and are therefore quite inadequate for involved differential studies of behavior patterns. While the nature of mental dysfunctioning is practically the same in groups of varying psychiatric classifications, other behavioral dimensions make it appear different. These differences can also be measured by means of psychometric tests. Limitations of space prevent us from making an incisive psychological analysis of intellect, sanity, mobility, and other dimensions as we conceive them. It may suffice to say that objective examination methods present a more accurate picture of behavioral organization than we may ever hope to obtain by subjective analyses and interpretations. The present shortcomings lie not in the psychometric method as a general tool of measurement and research, but in a faulty approach to the study of behavior and in shop-worn methods of standardization and interpretation. A revaluation of meanings and methods is the most urgent need of present-day psychometry.

PSYCHOMETRIC PATTERNS IN INDUSTRIAL SCHOOL BOYS

A. DOUGLAS GLANVILLE, Ph. D.*

Farnhurst, Del.

INTRODUCTION:

There have been numerous studies regarding the significance of intelligence as a cause of delinquency and crime. Many of these studies purported to demonstrate the existence of a high incidence of mental deficiency or of abnormal mental conditions among the delinquent and criminal groups. Eventually these results were widely accepted by those having to deal with the disposition and treatment of individuals found guilty of anti-social behavior. However, as more refined methods of measuring intelligence and better interpretation of mental test findings were developed, subsequent studies of delinquents and criminals frequently showed that the incidence of mental deficiency was not nearly as great as many of the earlier investigations had seemed to show and that more attention should be given to other abnormal conditions which

*Psychologist, Mental Hygiene Clinic and Delaware State Hospital.

might be relatively independent of native intelligence. It became evident that in most instances the anti-social behavior is generally a consequence "of a complex of human and social forces which makes difficult the study of any single influence in isolation." (2)

One of the findings of several of the more recent studies which is of especial psychological interest is that delinquents tend to obtain better scores on non-verbal than on verbal tests of intelligence. (1, 2, 6) This fact has been employed by some writers to explain why many of the earlier investigators, who used the Binet (a verbal test) exclusively, appeared to find so many mental defectives in delinquent and criminal groups. Porteus (6) particularly emphasizes the need of using a variety of tests and of not blindly accepting a test verdict in diagnosing the mental status of the delinquent. In the present study we propose to examine the nature of the psychometric patterns in a group of industrial school boys from whom Terman Vocabulary, Stanford-Binet, and Performance Scale quotients have been obtained. The study is merely a preliminary one, but it is believed that the results obtained are representative of those which will be found in any similar group of subjects.

SELECTION OF SUBJECTS

The subjects selected for this study were the first thirty boys examined by the author at the Ferris Industrial School, Marshallton, Delaware, by means of both the Stanford-Binet Test and either the Arthur Point Scale of Performance Tests: Form I or by the Army Individual Performance Scale. The Army Scale was administered to eight boys who were seventeen or more years of age. Except in a few instances when two tests were given a week apart, they were both administered on the same day. For the most part the examinations were made as part of the routine study of boys who either had just been committed to the school or were about to leave on parole. In a few instances the boys were referred because of some special problem such as eligibility for sterilization, failure to adjust satisfactorily in the institution, or failure to make good on parole. The original offenses leading to commitment included stealing, running away from home, persistent truancy, sexual

delinquency, and attacks on person or property. It is believed that the group of thirty upon which this study is based is truly representative of the population of the Industrial School.

The group includes 17 colored boys and 13 white boys of either foreign or native-born parentage. The ages range from 13 years, 9 months, to 20 years. The average age for the group is 16 years, 0 months. The group as a whole comes from homes of either middle class or low social and economic status.

The intelligence quotients reported in this study were obtained by using fourteen years as the upper chronological age limit. At the present time the American Psychiatric Association uses the sixteen-year limit for classificatory purposes whereas the fourteen-year limit has been officially adopted by the American Psychological Association. We regard the fourteen-year limit as the more satisfactory standard for scientific purposes. Nevertheless, the same type of test patterns would be found regardless of which age-limit is used. Separate quotients were obtained for the Terman vocabulary test. The vocabulary age norms used for this purpose are those derived by J. Jastak. (4)

RESULTS

In Table I the statistical results for the group of 30 subjects are shown in terms of quotients obtained on the various tests. The table also shows the range of quotients and the average quotient for the group when the highest quotient obtained by each subject on the three tests is treated separately.

TABLE I

Test	Range	Arith. Mean	S. D.
Terman Vocabulary	63-107	79.7	10.6
Stanford-Binet	64-117	79.5	12.3
Performance Scale	61-131	96.6	19.5
Test Giving Highest of the 3 Quotients	71-131	98.7	19.7

The Arthur Performance Scale quotients and the Army Individual Performance Scale quotients are listed together under the caption of Performance Scale.

It will be seen from Table I that for the group as a whole the average performance test quotient is higher than either the Terman Vocabulary or the Stanford-Binet quotients. The difference between the average performance quotient and the average Stanford-

Binet quotient is 17.1. When treated by the proper statistical method this difference is found to meet satisfactorily the requirement for complete statistical reliability. Twenty-five, or 83%, of the subjects obtained performance quotients which were from 4 to 51 points higher than their Stanford-Binet quotients. Five, or 17% of the subjects obtained performance test quotients from 2 to 15 points lower than their Stanford-Binet quotients.

The disparity between the performance test and the vocabulary test quotients tends to be of the same order as that between the performance test and the Stanford-Binet quotients. We find that the average vocabulary and Stanford-Binet quotients for the group are practically the same. With regard to individual subjects we find that for 16 of them the vocabulary quotient is higher than the Stanford-Binet quotient by 2 to 15 points. The average disparity for this group of 16 subjects is 6.1 points. For 13 of the subjects the vocabulary quotient was from 1 to 14 points lower than the Stanford-Binet quotient, and the average disparity for this group is 6.2 points. For one subject the 2 quotients are identical. We may summarize by saying that for the group as a whole there is no statistically significant difference between vocabulary and Stanford-Binet quotients.

If we examine the tests which yield the highest individual quotients we find that in 5 instances the vocabulary quotient is the highest of the three quotients obtained, that in 2 instances the Stanford-Binet quotient is the highest, and that in 23 instances the performance quotient is the highest.

Table 2 shows how the subjects would be classified as to mental level if a single test quotient were taken as the sole basis for classification. Although such a procedure is bad clinical practice, it is a well-known fact that even at this late date some clinicians are unduly influenced by a single test quotient, especially when that quotient is the one obtained from the Stanford-Binet test.

TABLE 2

Showing the distribution of 30 subjects as classified in terms of intelligence quotient obtained on (1) Terman Vocabulary, (2) Stanford-Binet, (3) Performance Scale, and (4)

the test yielding the highest of the three quotients.

Test	Moron	Border-	Dull	Average	
	I. Q. 50-69	line I. Q. 70-79	Normal I. Q. 80-89	I. Q. 90-100	Above I. Q. 110 plus
Terman Vocabulary	3	14	8	5	0
Stanford-Binet	5	12	9	2	2
Performance Scale	2	2	11	5	10
Test yielding highest					
I. Q.	0	4	10	5	11

It is seen from this table that in terms of the verbal test quotients (Terman Vocabulary and Stanford-Binet) the subjects tend to fall mostly into the borderline group whereas in terms of the performance test quotients only 4 of them fall below the dull normal range and 50% of them fall either in the average or above average ranges. In brief, the results of this study are in agreement with those of other investigators who have found that delinquents score higher on non-verbal than on verbal tests. Therefore, the typical boy of this group is a boy of average intelligence and with a language development that is about 20% retarded.

Many questions may be raised concerning the significance of these results. One question has to do with deciding which test quotient is to be regarded as the more valid measure of the individual's native intelligence. Another question concerns the problem of why delinquents as a group tend to obtain lower quotients on verbal tests than they do on non-verbal tests.

With regard to the first question our answer is that the highest test quotient is the one which most closely approximates the individual's actual native intelligence. If a test of intelligence is valid, reliable, well standardized, and properly administered, an individual will not obtain a higher score than his general intellectual potentialities permit. Whether it be defining words, repeating digits, solving either abstract or concrete problems, or making a successful exit from a maze he will do no better than his native intelligence permits provided he has not previously practiced the specific performances involved in a given test. On the other hand, he may do more poorly on a test than his latent intellectual capacities would permit if his functional efficiency were not lowered by a special disability, poor emotional control, or some other interfering factor on a non-intellectual type.

The answer to the second question, namely, why do delinquents as a group tend to do more poorly on verbal than on non-verbal tests leads us to one of the important causes of delinquency. Some clinical psychologists have answered this question by saying that most of these individuals are mentally retarded but have superior manual ability. This is not a satisfactory answer, however, because the concrete performance tests of the type used in this study involve the higher mental functions just as much as the verbal tests of the Stanford-Binet. A much more satisfactory answer to this question is that individuals who obtain verbal test quotients which are lower than their performance test quotients suffer from a retardation of their language functions which is relatively independent of native intellectual development. In our study of these boys we have been impressed again and again with the frequent occurrence of language deficiencies of the type so well described by Orton. (5) The majority of these boys either have or have had a reading disability which seriously interfered with normal progress in school. Other types of language retardation such as speech defects and writing disabilities are frequently found. A great many of them are either left-handed or ambi-dextrous. Orton has demonstrated the importance of this factor in the normal development of the language functions. Because of their inadequate language expression and comprehension they are at a decided disadvantage on verbal tests.

While we do not claim that language retardation alone causes delinquency it is easy to see how it may be an important factor leading in that direction. Since many of these boys were frustrated in their school work they eventually lost interest in it and were turned to truancy or sought self-expression in ways that are not socially acceptable. The poorer the home supervision or the more maladjusted the boy was in other ways the more serious the consequences of his school difficulties tended to be. In some cases it appears that

the language difficulty was the initial cause of the subsequent maladjustment and in other cases it was a contributing factor of varying degree of importance. If it had occurred in isolation or at least in conjunction with fewer other factors the boy would probably have succeeded in making an adequate social adjustment as do most individuals who are hampered by language difficulties of the type we are discussing.

Only a few words can be said here about the small percentage of boys whose performance test quotients are lower than their verbal test quotients. In those instances in which the disparity was greatest there was evidence of inherent instability. Individuals having this type of psychometric pattern are usually found to be suffering or will suffer from some maladjustment of a psychogenetic nature. Psychometric patterns of this type are discussed in this Journal by Dr. J. Jastak, Chief Psychologist, Mental Hygiene Clinic, Delaware State Hospital. Responses of individuals obtaining psychometric patterns of this type are clearly different in quality from the responses of individuals with verbal test quotients which are lower than their performance quotients. The group in which the verbal test quotients are higher show an instability of attentional control which is usually not found in the group with higher performance quotients.

In conclusion we may summarize by saying that the results of this study agree in general with those of other investigators who have shown that the incidence of mental deficiency among delinquents is not as great as was once believed. Our study also shows that a large percentage of the group of boys studied are retarded in their language development far below the level of their native intelligence. On the other hand, the percentage of cases showing inherent instability in their psychometric patterns is relatively low. Language retardation as one of the important causes of delinquency is suggested as being of significance in this study.

VERBAL AND MANUAL FUNCTIONS AT THE PRESCHOOL LEVEL

DIANA S. OBERLIN, M. A.*

Farnhurst, Del.

From the mental hygiene point of view, the sooner actual preventive measures may be taken in regard to any behavioral or mental abnormalities, the better is the chance of good adjustment between the patient and the environment. Unfortunately many patients are brought to clinics after almost irremediable harm has been done and the factors originating the difficulties have been obscured by a hierarchy of other factors which have grown one to another like barnacles to a rocky ledge. Nevertheless occasional cases which present an excellent opportunity for preventing major difficulties are brought to clinics. These are children between the ages of eighteen months and five years—the so-called “preschool” children.

Psychometric tests have, in the past, been made up largely of a hodge-podge of separate items presumably measuring a number of independent functions such as ability to memorize, ability to reason, counting ability, motor coordination, vocabulary and ability to interpret. The list of items is almost without end. A broader point of view tends to divide these into non-verbal or concrete items and verbal or abstract ones. An analysis of any year-scale which is constructed so as to include both types of sub-tests shows clearly that individuals tested by such a scale frequently have more difficulty with one type than another, although in many cases the differences are so slight as to be negligible. Further questions arise from these facts. Are these differences real and are they inherent? The answers are yes and perhaps. If these differences are not inherent they are, at least, operative at a very early age, and apparently persist throughout the later life of the individual unless treatment is undertaken to modify them.

All functions are equally important in assuring adjustment in any individual. The normal, well-integrated person is equally proficient in tasks demanding verbal ability and in dealing with concrete and practical situations. In considering the development of intellectual capacity it is not unapparent that truly defective

individuals are less adequate in all functions than persons with normal intellectual development. There are, however, many persons who give the impression of being feeble-minded when they are actually not. Further, a single psychometric test may still lead one to consider such cases defective.

Burnham (1) has written of these children: “Examples of all of these forms of pseudo-feeble-mindedness are found in the public schools. Every teacher is likely to meet one or more of them—the child who shows symptoms of feeble mindedness because of some sense defect or adenoid growth or the like; the child with will inhibited because of unjust punishment or constant failure; the child with development arrested because of extremely narrow conventional environment; the suspicious child, perhaps an only child in the family, laying the foundation for paranoia in later life; the child whose thinking is erratic because he does not correct his reasoning by reference to experience; the over-stimulated, precocious child, perhaps a candidate for dementia praecox; the child who never has had opportunity for development.

“In all these cases there is good opportunity for recovery during the years of childhood and adolescence. They are, for the most part, merely psychoses of development. To diagnose them as feeble-mindedness is the gravest mistake.”

It is readily observed from the foregoing text that it has been recognized for some time that physical and environmental conditions may be very influential in determining the child's apparent mental ability. It has, on the contrary, only of late years been recognized that poor spatial orientation and verbal ability determine to a great degree any child's success in academic work. Inability to spell and read may be difficult for the child from the time he first enters the classroom and, unless adequate treatment is given, difficulties will persist in these subjects, and new difficulties will arise with all other subjects which are in any way dependent upon reading ability. The child, in consequence, appears stupid, when in reality his ability to deal with non-verbal material may be average or above. It is thus apparent then that ability to read is not in itself a measure of intelligence.

*Psychologist, Mental Hygiene Clinic and Delaware State Hospital.

Jastak (2) has pointed out that discrepancies between vocabulary and performance test scores are adequate measures of mental instability. Vocabulary scores of children having parents who speak a foreign language may not be used as accurate indices of innate intelligence. Scores derived from performance tests may not be used as accurate indices of intellectual capacity if the child is known to be suffering from personality difficulties such as occur in psychosis, psychopathy, neurosis and other abnormal states of the mind, except mental deficiency. Achievement on any test is the result of the coordinate functioning of all the personality dimensions.

It is apparent from the above statements that poorly correlated verbal and non-verbal scores presage some difficulty and that the lower score is a useful indication of the source of the child's maladjustment.

For a number of years verbal and performance scores have been compared for this purpose when such tests have been given to children of school age. Tests for younger children have not been so well-developed in verbal items and the majority of subtests on the most frequently used preschool scales have been concerned primarily with manual behavior. This has weighted the entire score with reference to the child's performance ability.

The Merrill Palmer Preschool Performance Scale which has been widely used during the past half dozen years is composed in such fashion. Both performance and verbal test items are included but there is a marked preponderance of non-verbal material. All tests are arranged in order of difficulty and grouped into intervals representing six months of mental age. Accordingly approximate mental age rating may be interpolated from the position of the test within its own group. Tests are scored as success, failure, refusal, and omission. Refusals and omissions which fall within the range of success are given full credit.

In order to determine the relationship between verbal and non-verbal scores on the preschool test and the relationship between mental ages and test quotients derived in this way twenty-six case records were investigated. These records comprise the total number of cases given Merrill-Palmer tests at the Mental

Hygiene Clinic in 1931-32 and who, at that time or since, have been given Stanford-Binet tests. Three types of psychometric patterns were derived from the analysis. They were: 1. the verbal quotient higher than the performance quotient; 2. the verbal quotient lower than the performance quotient; 3. both quotients equal. The consistency between the intra-test pattern and the patterns derived from comparing the Merrill-Palmer total quotients and the Stanford quotients is startling. When type one is present in the preschool test, the Stanford quotient is, in every case, higher than the Merrill-Palmer; where type two is present the Stanford quotient is, in every case, lower. Disparity between verbal and non-verbal Merrill-Palmer quotients ranges from 0 to 49 points.

It is thus evident that within limits the separate Merrill-Palmer quotient may be used to predict subsequent Stanford test scores. It follows, too, that the Merrill-Palmer test can to some extent be used to estimate future school success, regardless of level of native endowment.

Merely as examples of the foregoing patterns and findings, the following cases, selected at random, are presented.

1. William was given a Merrill-Palmer test in 1931. His chronological age at that time was five years and eight months. The Merrill-Palmer quotient was 86, the non-verbal quotient was 92 and the verbal quotient was 55. A Stanford-Binet test administered six months later resulted in a quotient of 72. A Stanford-Binet test given four years later, when William was ten gave a quotient of 77 and a vocabulary quotient of 64. The indications are, of course, that verbal ability has always been inferior. William, at the present time, is reported as retarded in school, particularly in reading.

2. Sally was given a Merrill-Palmer test in 1932. She was then one year and eight months old. The resultant verbal and non-verbal quotients were 122 and 105 respectively. A Stanford-Binet test administered seven months later gave a quotient of 115. It is probable that a Stanford-Binet test given at the present time would show a quotient even more nearly approximating the verbal Merrill-

Palmer quotient as the verbal quotients have a tendency to increase with age in such cases.

3. Helen, in 1931, received a Stanford-Binet rating of 57, in 1935 her Stanford-Binet rating was 50, and her vocabulary quotient was 38. In 1932 Helen was tested on the Merrill-Palmer scale; her non-verbal quotient was 55 and her verbal quotient was 34. The conclusion to be drawn from these facts is that even in a mentally defective child the discrepancy between test results persists. The drop on Stanford-Binet quotients is a function of the Stanford test; as the material becomes more verbal the child with low verbal ability is less able to succeed on the test.

Some general conclusions may be drawn from minor statistical data derived from the twenty-six case records. The sample is unfortunately insufficient to constitute an authoritative body of material. Nevertheless, the results are significant. The correlation (rho method) between the Stanford-Binet and Merrill-Palmer performance quotients yields a coefficient of .646 with a probable error of $\pm .06$. The correlation between the Merrill-Palmer verbal quotient and the Stanford-Binet yields a coefficient of .828 with a probable error of $\pm .04$. The correlation coefficient derived from Terman Vocabulary and Merrill-Palmer verbal quotients is $.943 \pm .04$. The practicability of using Merrill-Palmer quotients as the basis for predicting future Stanford-Binet and Vocabulary quotients as well as academic success is indicated by these findings.

The following case offers an illustration of the value of analyzing Merrill-Palmer test results into psychometric patterns.

Mary was characterized by her teacher as having no special difficulty in her studies, but as being just generally backward in her work because of slowness in obeying commands. Her marks for the semester included a C in reading and a B in arithmetic. A Stanford-Binet test was administered and she earned a mental age rating of exactly six years with a resulting quotient of 71. Mary was then eight years and four months old. The psychologist rated Mary as low borderline in intelligence but stated that a performance test would be given since the child spoke Italian as well as English at home and there might be present a language handicap.

The following week a Merrill-Palmer test was given. The psychologist noted as follows: "She cooperated very well and seemed to enjoy the test. Her score was lowered by the fact that she failed the language test. According to the results of the performance test, she has a mental age of six years and four months and an intelligence quotient of 75. The results of this test indicate that her manual ability is only slightly superior to her verbal intelligence. It would seem that a language difficulty does not enter into the results of the tests as she rates only slightly higher on the performance test than on the verbal intelligence test."

Three years later Mary was given another Stanford-Binet test. Her age was then eleven years and six months, her mental age was eight years, and the quotient was 70. These results were in strict agreement with the previous test of verbal intelligence.

After a two-year interval, Mary was again seen by a psychologist. She was tested by the Terman Vocabulary test and the Arthur Performance test; quotients were 53 and 81 respectively. Her performance ability was definitely at the dull normal level.

The earlier performance type test, the Merrill-Palmer, is now considered with reference to later findings. A careful analysis reveals that only one performance item was failed, and a complete elimination of the verbal factor would place Mary's native ability at the level designated as six years and six months or more. It is unfortunate that a more advanced performance scale was not administered at the time since Mary would have unquestionably rated in the dull-normal classification.

In contrast to the non-verbal findings the following is brought out by analysis. The Merrill-Palmer verbal quotient is 48. There is fully thirty points discrepancy between verbal and non-verbal quotients, indicating a definite language handicap.

Here then is the reason for Mary's inability to carry out commands. She didn't understand the language. Her language difficulty may also be one of the factors responsible for the lower ability in reading than arithmetic. At the time when Mary was seen, diagnostic tools were not as sharp as they now are and only the surface was scratched.

It is hoped that with better tools and a better understanding of the uses to which they may be put, clinical psychologists may be able to give better service in resolving difficulties based on language inadequacy. It is not improbable that many future problems can be avoided by more care in administering and more incisive analysis of test results of children of preschool age.

TREATMENT OF IMPACTED TEETH

W. H. NORRIS, D. D. S.*

Wilmington, Del.

LOUIS KRESHTOOL, D. D. S.**

Farnhurst, Del.

The dental department of the Delaware State Hospital was established May 1, 1921. Since the inception of this department it has had ample opportunity to observe "the impacted tooth" in all its forms in a large number of unselected patients, and over this period of time it has been possible to compile a definite amount of useful data in regard to this important subject. Particularly has this been possible after the creation of the X-ray department in 1928 and the establishment of routine dental roentgenograms of all patients admitted to this hospital. Since this procedure has been instituted there has been close coordination between the two departments. Unfortunately all patients over 70 years of age do not have routine X-ray examination. Thus it is possible that in a few cases impacted teeth are not detected.

In the past nine years of routine dental X-ray examination of 2,649 new patients, 6.25% of these patients had one or more impacted teeth in either the upper or the lower jaws, or both. Of this number only 30% of the impactions were removed, for the reasons which will be discussed below. It may be interesting to mention further that among these patients there was an average of 2.28 extractions per patient, or more than two infected teeth per person.

Concerning the distribution of the impacted teeth, 78% were found among male patients; 22% among female patients. It must be noted that these figures were limited to patients past 23 years of age, this standard being set arbitrarily as the age limit for the normal time of eruption of the third molar.

The frequency with which the impacted tooth was found in the various positions in the mouth conforms closely to the findings of both G. B. Winter of St. Louis and Adolph Berger of New York as follows:

1. Lower third molar
2. Upper third molar
3. Upper cuspid
4. Lower bicuspids and cuspid

In many cases the impacted tooth was found in a denture which had a full complement of teeth, however not infrequently the impacted tooth was isolated in an edentulous area, or even in an edentulous mouth.

The lower third molar in particular was found in all of the classical positions. The most commonly observed position was that of mesial inclination, often in very close proximity to the distal surface of the second molar. Frequently the mesial inclination was accompanied by a buccal or lingual displacement. Rarely has the lower third molar been found with a distal inclination toward the ramus of the mandible. In many cases of edentulous mouths, the lower third molar has been found in an upright or vertical position but retained in bone, the eruptive forces for some reason apparently having ceased functioning prematurely.

The upper third molar has been observed most frequently in a buccal position. Next in order was the mesial inclination; and last, the lingual or palatal inclination. It has been interesting to notice that most of the impacted upper third molars have had fused roots. Occasionally the roots have been distinctly bifurcated forming the normal three-rooted tooth. In a few cases four definite roots have been observed.

Of the impacted cuspids observed, all have been confined to the palatal surface of the maxillary bones. In only three instances has it been found that both of the upper cuspids

*Visiting Dentist, Delaware State Hospital.
**Resident Dentist, Delaware State Hospital.

were impacted in the same patient. All other cases showed the cuspid of the opposite side either missing or in more or less normal relation to the rest of the arch.

The lower bicuspids have been found least frequently in the impacted position. Among those observed, it was found that almost most an equal number of each were in either the lingual or the buccal position. Removal of these teeth in most cases was accomplished from the buccal aspect, in order to allow for greater convenience.

At this institution the impacted teeth have been removed under a variety of anesthetics. When conditions were favorable a local anesthetic was employed in combination with mild sedation. Novocain combined with epinephrine was used until the advent of the novocain-cobefrin solution, which is now the anesthetic of choice. Whenever possible a block injection was used in preference to the infiltration technic.

If the patient to be operated upon was uncooperative to the extent of being resistive, struggling, or combative, the use of Evipal intravenously has been found successful as an anesthetic. However the duration of anesthesia is for only a brief period of fifteen to twenty minutes and must be limited to operative procedures of the uncomplicated type. This drug must be used cautiously and is not advocated for other than hospital use, nor without experienced medical assistance.

For the more prolonged type of operation upon patients too difficult to handle under local anesthesia, ether has been the anesthetic of choice. The patient was properly premedicated with morphine and atropine and the services of the anesthetist were called upon. After the removal of the tooth or teeth the patient was put to bed and the usual post-operative procedure was instituted.

The removal of impacted teeth is considered a minor surgical operation and is performed only by the dentist on the consulting staff at a previously specified time. The resident dental interne and the oral hygienist act as assistants during the procedure thereby increasing efficiency and expediting the operation, and incidentally obtaining valuable experience in procedure and technic.

Although at one time the theory was advanced that certain types of the mentally ill were aided in recovery by the removal of impacted teeth, such results have not been manifested by any of the cases operated on at this institution. It has been noted, however, that some of the physical discomforts attending the presence of impacted teeth have been successfully relieved upon removal of these teeth. Such conditions as localized pain and infection caused by a pericoronal abscess of a partially impacted third molar have responded promptly to removal of the tooth involved. On occasion a partial trismus has been cleared up by the extraction of an impacted third molar. Neuralgic symptoms as in headache have likewise been relieved by the removal of an impacted tooth.

In most of the cases of impacted teeth, the treatment has been of a conservative nature. Indiscriminate removal of all impacted teeth has not been attempted. In many cases the imposition of such surgical shock as accompanies the removal of some of the impactions would be far more harmful than beneficial to the patient. The paramount aim is that treatment, which in the light of present scientific knowledge together with the physical conditions at hand, will result in the most benefit to the patient.

WOMAN'S AUXILIARY

The April sewing meeting was held at the home of Mrs. Frederick A. Hemsath in Hockessin, on April 20th. It was originally planned to meet there in May, but due to a change in plans the May meeting will be held at the Hotel Du Pont on May 18th, at which time we will be the guests of Mrs. H. G. Buckmaster.

The previous sewing meeting was held at the home of Mrs. Carl Henry Davis in Wawa-set Park, on March 16th. Mrs. Butler reports there have been over 200 garments completed during the winter.

The last business meeting for this reason will be held Tuesday, May 11th, but as yet the place of meeting has not been decided upon.

During the recent drive of the Women's Field Army for the Control of Cancer, Mrs. Robert Tomlinson and Mrs. Roger Murray headed a team of Auxiliary members.

Mrs. Lawrence Jones, President, is now appointing committee members to work in conjunction with the Atlantic City County Auxiliary on arrangements for the National Convention to be held in Atlantic City, June 7th to 11th.

DELAWARE ACADEMY OF MEDICINE

The review course on obstetrics has been computed, and was well received by a large number of physicians. For those who wish to do additional reading, the recent literature includes:

Symposium on Problems in Obstetrics. Surgical Clinics of North America. 17:1-81, Feb. 1937.

Obstetrical Symposium. American Journal of Surgery, Feb. 1937. Special number covering some of the most important phases of clinical obstetrics. H. J. Stander, Prof. Obstet. and Gynec. Cornell University Medical College, guest editor.

The library receives regularly: Surgery, Gynecology and Obstetrics (complete files v. 1, 1905 to date) and American Journal of Obstetrics (files nearly complete from v. 4, 1922 to date), as well as other journals containing papers on this subject from time to time.

The following new books have been received:

Meakins, J. C.: The Practice of Medicine. St. Louis: Mosby, 1936, 1343 p. (Reviewed in the Delaware State Medical Journal, February, 1937.)

Hoffman, F. L.: Cancer and Diet, with Facts and Observations on Related Subjects. Baltimore: Williams & Wilkins, 1937, 767 p. (Presented by Mr. P. S. du Pont.)

The library acknowledges with thanks the following contributions: Medical books and journals from Dr. D. T. Davidson, Dr. C. E. Wagner, Dr. Alex Smith, Dr. L. B. Flinn and Dr. J. F. Hynes. Dental books and reprints from Dr. J. L. T. Appleton and Dr. J. E. Aiguier of the School of Dentistry, University of Pennsylvania, through Dr. C. R. Jefferis, and "The Medical Department of the United States Army in the World War," 15 v., from Dr. W. Edwin Bird.

MISCELLANEOUS

Call For Papers

The program for the next annual session of the Medical Society of Delaware is now being prepared, and will be completed soon. Any member who wishes to present a paper at this session (Wilmington, October 11, 12, 13) must send his name, address, and title of paper to Secretary Speer on or before May 1st, 1937.

Exhibit of Colonial Medicine

Physicians, medical societies, and museums throughout the state are being asked by the State Board of Health to lend any early American medical instruments, books, or equipment they may have, for use in an exhibit of "Colonial Medicine," during Dover Day, May 1st. Since this date is also National Child Health Day, the State Board of Health is using this means of observing the occasion of drawing the attention of the thousands of visitors to the immense improvements, since Colonial days, in the care of children, and of setting forth the present-day methods.

In the medical exhibit, it has been stated, will be combined, "Some of the lore of yesterday, the knowledge of today, and plans for the citizens of tomorrow." Delaware, the first state to join the Union, has been a leader in many health activities, and has ranked near the top in the results of its infant and child health work. Located in the annex of the oldest state house in continuous use, the Board of Health has reached throughout the state to aid in the care of the youngest future citizens—often aiding in their welfare even before they see the light of day.

With antique leeching cups, mortar, pestle, vials, herb jars, and musty tomes, the State Board of Health will strive to recreate the office of the early American doctor, as part of Dover Day; beside it will stand an exhibit of child health plans, approved methods, and literature, as part of National Child Health Day.

The Medical School Survey

Herman G. Weiskotten, Syracuse, N. Y. (*Journal A. M. A.*, March 27, 1937), admires the spirit with which thousands of practitioners of medicine, without any financial remuneration, are contributing of their time and effort to the cause of medical education through the survey of medical colleges in this country. In presenting some of his observations and immediate reactions to the survey he discusses some of the problems in the development of medical education which the study has thrown into relief and outlines the technic followed in the conduct of the survey. Comprehensive as the procedure in the conduct of the survey may appear, it was recognized from the very beginning that it left much to be desired. Certainly three days is inadequate time in which to learn all about any school. However, certain fundamental facts could be determined definitely. As the survey progressed there began to evolve certain fundamental principles which were recognized as essential to a satisfactory undergraduate course in medicine. Some of these fundamentals include the dominant importance of the faculty in organized education, the problem of the use of student assistants as responsible teachers, and the significance of degrees in the evaluation of university faculties. The objectives of different schools may, and perhaps should, vary in certain respects, but all should include such basic training as is essential to all fields of medicine, and in every school the curriculum should be planned for its average student. At the same time it should offer additional opportunities for the better students. This is a principle which is fortunately becoming rather generally recognized in the field of higher education. The problem of the size of the student body as related to educational standards, physical facilities, departmental staffs, kind and amount of clinical facilities and the public need deserve careful consideration. The complete availability of an adequate number of clinical cases, sufficiently diverse as to disease type and available, moreover, under conditions which permit a high standard of training and experience for the student is one of the greatest problems facing most of the schools of the country. The responsibility of the college in connection with

internships is a problem of fundamental importance regardless of the requirement of the intern year for the M. D. degree. Beyond this is the relatively enormous problem of graduate work in medicine.

OBITUARY

WILLARD E. SMITH, M. D.

Dr. Willard E. Smith, well-known physician and one of the founders of what is now the Wilmington General Hospital, died at his home in Wilmington, on March 23, 1937. He was 72 years old.

Dr. Smith has been ill for about four years of heart trouble and a complication of ailments. His family was at his side when the end came.

Dr. Smith was born in Binghamton, N. Y., on August 15, 1864. He was graduated from the Philadelphia College of Pharmacy and Jefferson Medical College, having been a pharmacist before he completed his course in medicine. His office for most of the years of his active practice was at Fourth and Harrison streets, where he also operated a drug store.

He was one of the founders of the Physicians and Surgeons Hospital, now the Wilmington General Hospital, together with Dr. Joseph P. Pyle and Dr. Albert Robin. He served for many years as treasurer of the hospital association. He was chairman of the hospital medical board upon his retirement from active practice due to illness, about four years ago.

He served as examining physician for the Draft Board in Wilmington during the World War. He served as a member of the Wilmington Board of Health during the administration of the late Mayor J. Harvey Spruance.

He was an elder of West Presbyterian Church, and a member of the American Medical Association, the Medical Society of Delaware, the Delaware Academy of Medicine, the New Castle County Medical Society, and Lafayette Lodge, No. 14, A. F. and A. M.

Dr. Smith is survived by his wife and two children, former Secretary of State Walter Dent Smith and Mrs. Ernest R. Dent.

Funeral services were conducted at his residence by his pastor, Rev. Dr. A. H. Kleffman, on March 26, 1937. Interment was in the Wilmington and Brandywine cemetery.

BOOK REVIEWS

Theory and Practice of Psychiatry. By William S. Sadler, M. D., Chief Psychiatrist, Chicago Institute of Research and Diagnosis. Pp. 1231. Cloth. Price, \$10.00. St. Louis: C. V. Mosby Company, 1936.

Dr. Sadler has written in this book one of the greatest studies of psychiatry which it has been the privilege of this writer to read for a long time. He has avoided difficult technical terms, which at best are often an indication of pseudo-knowledge and should be eliminated from medical literature. He has entered into detail on the aspects of the psychogenic mental conditions and has clarified the neuroses to such an extent that the student in psychiatry can grasp the situation readily. Because of his avoidance of technical terms seldom used, if ever, in general medicine, he has written a book which should be in the hands of every physician, since in the practice of the general practitioner a great percentage of patients suffer from mental maladjustments of some type. He is one of the few authors who has entered into the subject of the treatment of these conditions in detail, giving definite programs for the patient which can be readily carried out in the home environment, and not of least importance he has described the attitude of the physician which is necessary if successful treatment is to be carried out.

Physical Therapeutic Methods in Otolaryngology. By Abraham R. Hollender, M. D., Associate in Laryngology, Rhinology, and Otolology, University of Illinois. Pp. 442, with 189 illustrations. Cloth. Price, \$5.00. St. Louis: C. V. Mosby Company, 1937.

This book is contributed to by a number of authors.

Part 1 is devoted to Physical Agents—Principles—Effects. The reviews of these physical agents and the physics set forth furnish a handy reference and should be useful to those who have had but little physics and to others who are interested in refreshing their memories.

There are about 20 pages of definitions next to the index, reprinted from the Handbook of Physical Therapy. Some physiology is given in the text, but limitation of space re-

stricts that to a brief discussion. The authors have stressed the clinical aspects of the subject and offer a clinical guide to the management of a number of oto-laryngologic diseases. Those using some of these therapies should inform themselves from other sources. For example in Part III, Dr. Chevalier L. Jackson discusses Endoscopic Approach to Therapy, but one of course has to acquire the technic elsewhere. There is, however, an abundance of references which can be used for such purposes. Descriptions or references to other forms of treatment should make the book safe in the hands of the uninitiated.

Memoranda of Toxicology. By Max Trumper, Ph. D., formerly Lecturer on Toxicology, Jefferson Medical College. Third edition. Cloth. Pp. 304. Price, \$2.00. Philadelphia: P. Blakiston's Son & Company, 1937.

This is a book with which we are not at all impressed. Much of the information is too sketchy to be of any value to those interested in toxicology, and other information is very much out of date. For example, some of the information on tetraethyl lead is considerably misleading.

In many instances there is nothing recommended in the way of treatment, such as nitro-benzene and aniline poisoning.

We would point out that the author recommends sodium bicarbonate for the treatment of acid poisoning by mouth, when it is a well-known fact that the administration of an alkali on top of an acid may cause so much generation of gas as to even rupture the stomach.

We note that under hydrogen sulphide it is stated that this is a very active poison but on account of its offensive odor it is not liable to be accidentally inhaled. The truth of the matter is that hydrogen sulphide in high concentrations immediately paralyzes the sense of smell, and there have been many instances where people have been killed almost instantaneously upon walking into high concentrations without ever realizing its presence.

On the whole the information contained in this book is extremely disappointing.

1789—MEDICAL SOCIETY OF DELAWARE—1937

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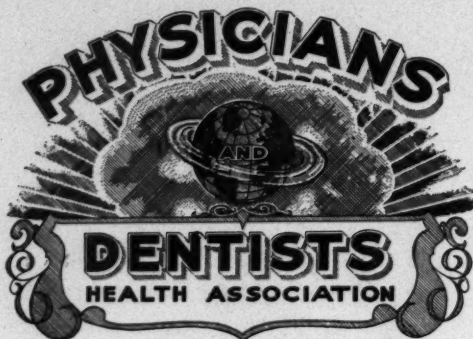
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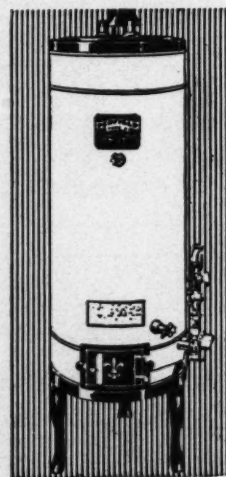
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